FOOD MANUFACTURE

A PUBLICATION OF THE LEONARD HILL TECHNICAL GROUP NOVEMBER 1, 1959

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Australian user reports

Since we installed the Foodtech K.S. all our products have achieved a uniformity previously impossible with the usual mincers. Sales have gone up considerably thanks to this most economical machine and the high quality of its product.

U.K. user reports

Since K.S. machines have been incorporated in our production lines, skinless sausages have improved considerably in colour, and peeling is much easier. Pork sausages show excellent colour and binding, and luncheon meat and pies show improved texture and colour. These are undoubtedly the most profitable machines in our factory.

German user reports

I installed a K.S. in 1955 and have now four of these machines in operation. I cut out mincers altogether. The K.S. gave all my products uniformity, high binding power and texture. I am an extremely satisfied customer and I can recommend this machine to all my colleagues for economy and speed.

U.S.A. user reports

The K.S. Mincemaster gives a uniform proportion of meat to fat throughout every mix. It enables you to aim at, say, a 30% fat content and get it every time. There is no question of varying between 26% and 34% from batch to batch. This invariable high quality promotes sales confidence in the product and ensures better sales results.

For full details write to: **Foodtech Ltd.** **Queen Anne's Place, Bush Hill Park, Enfield, Middlesex. Telephone: LABurnum 6656/7**

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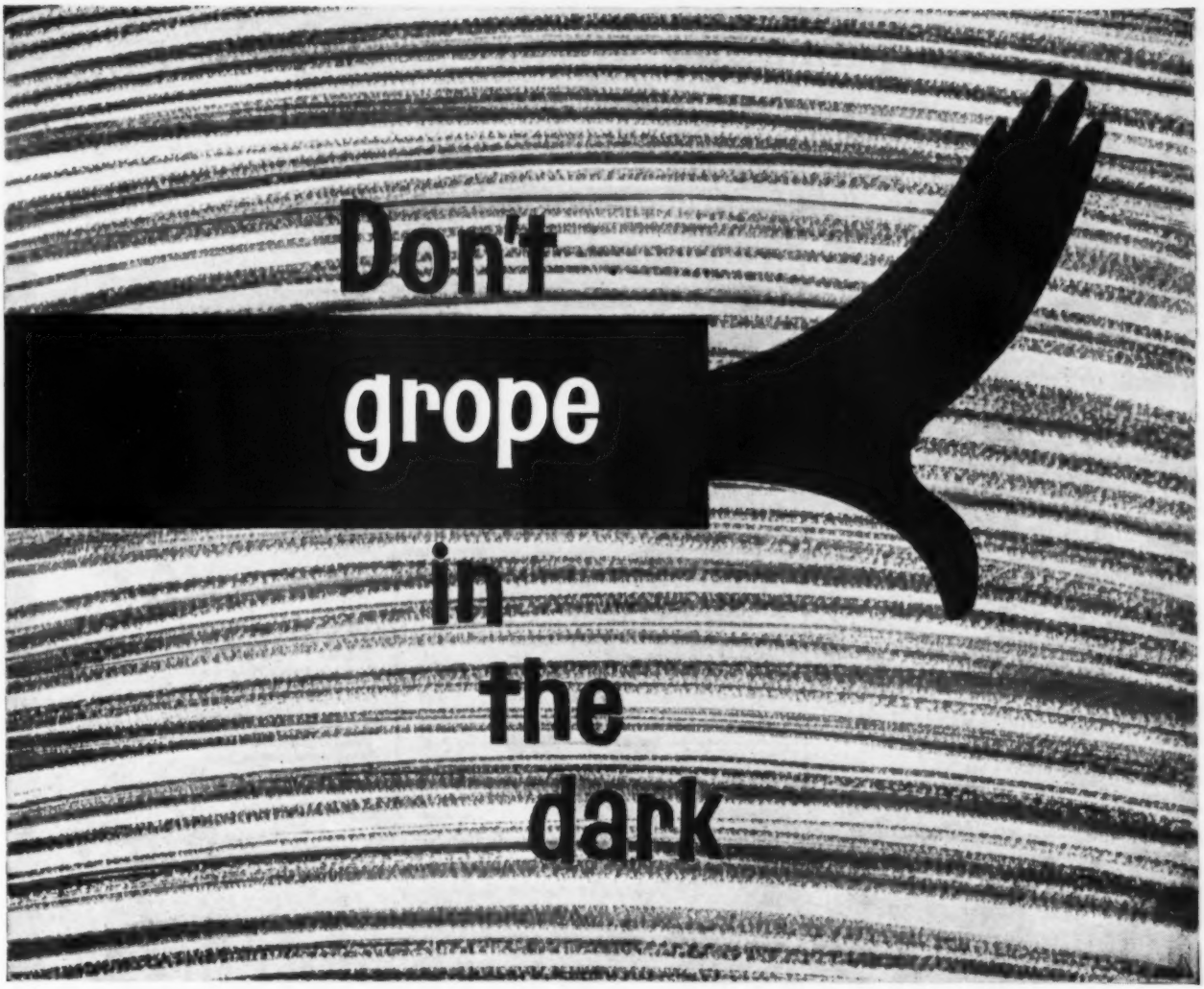

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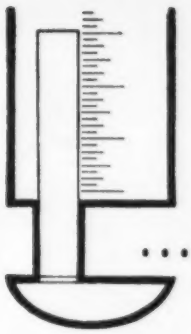

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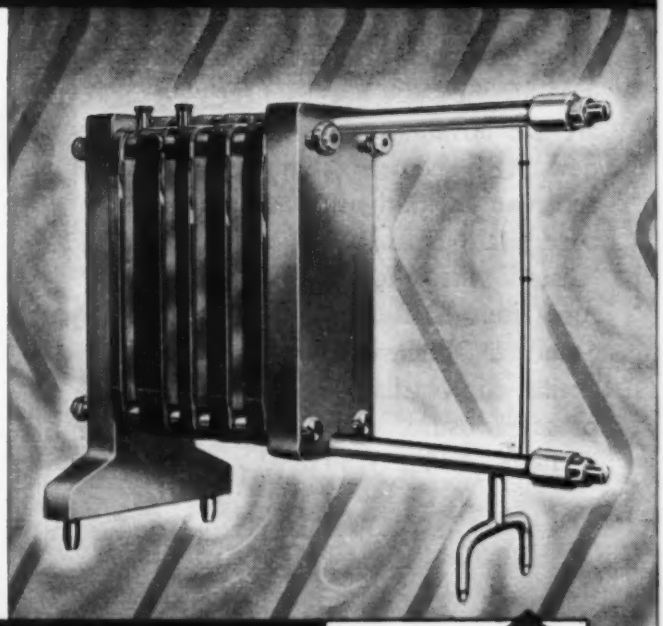

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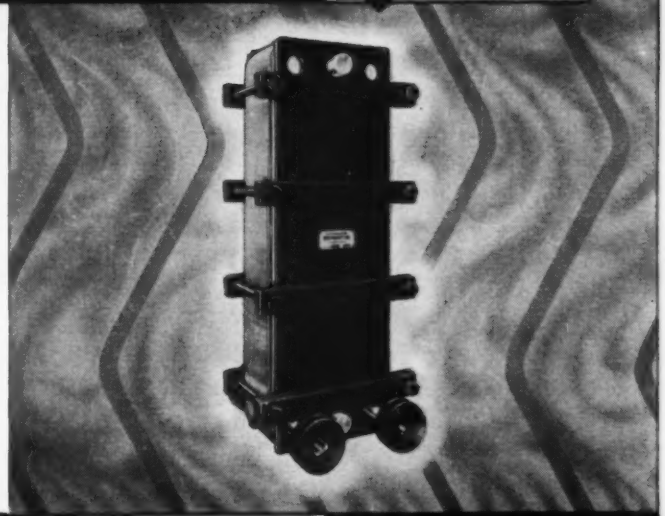

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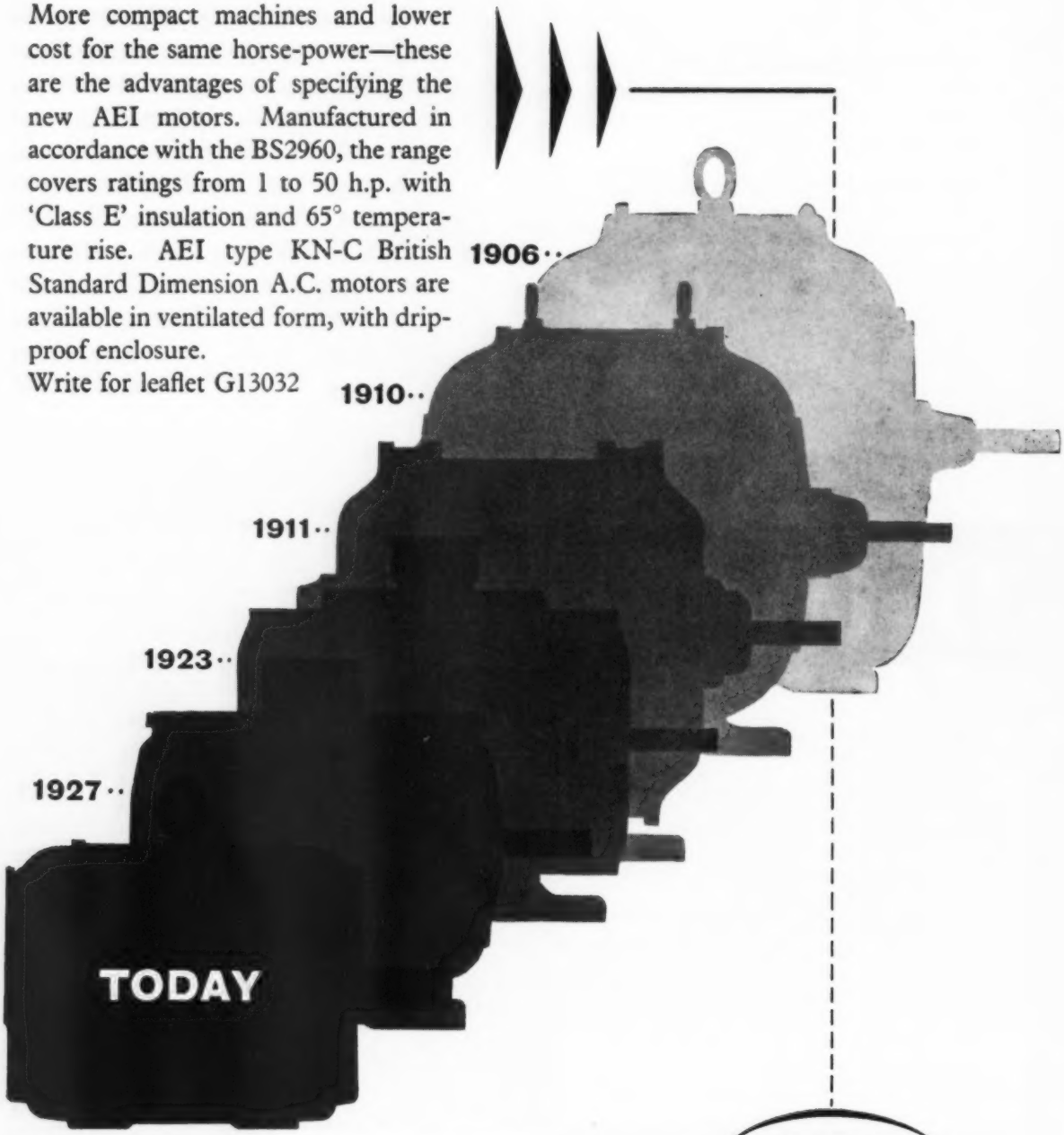

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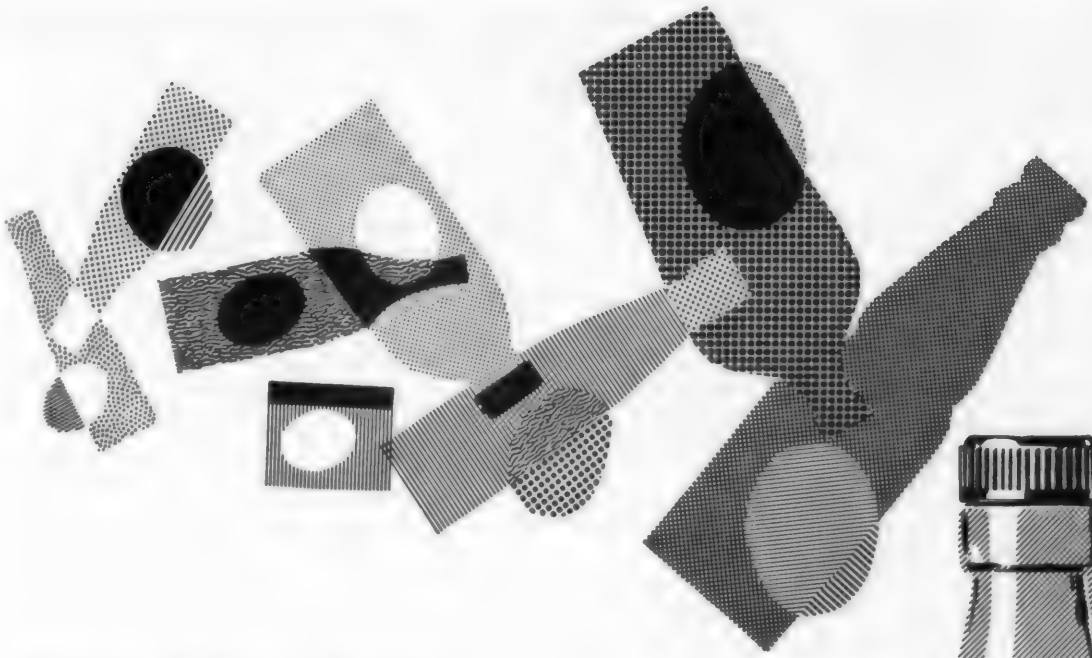

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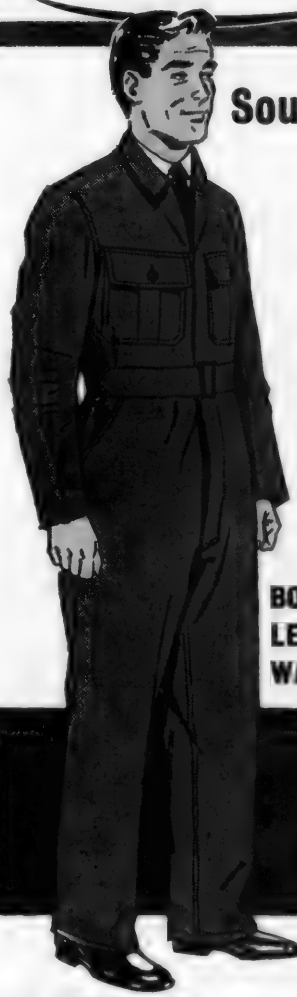

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HUNDREDS
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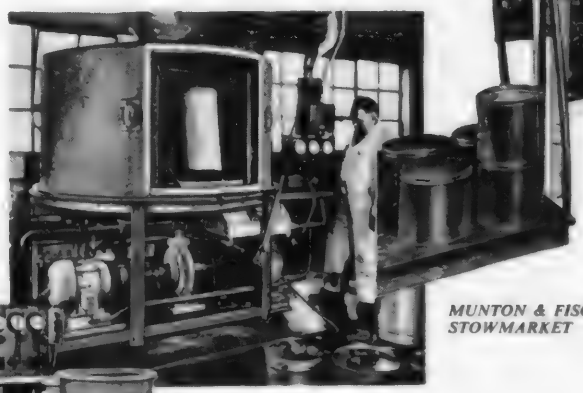

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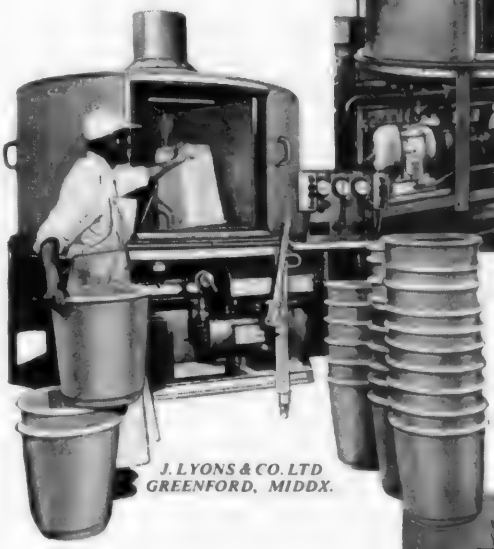

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W. H. washing equipment handles containers with amazing speed and thoroughness. Out they come, clean as whistles, completely ready for further service.

W. H. have solved can, churn and container washing problems in many industries, and their wealth of experience is freely at your disposal. If you have a container-washing problem, Wright Hargreaves can supply the answer—either as a standard machine, or as equipment specially tailored to meet your individual requirements.

Hand-fed and Automatic rotary equipment for washing/sterilizing containers at a rate of up to 360 per hour.

Straight-through systems —fully automatic—for washing/sterilizing up to 720 containers of varying sizes per hour. Automatic removal, washing and replacement of lids can be incorporated. Power conveyors with 'Patent' non-friction bends are available to help further speed the operation.

Whatever your problem, we'll be happy to study it and make recommendations.

Wright Hargreaves are the sole agents in England, Scotland and Wales for Silkeborg Plate Heat Exchangers that meet the highest standards of the food industry.

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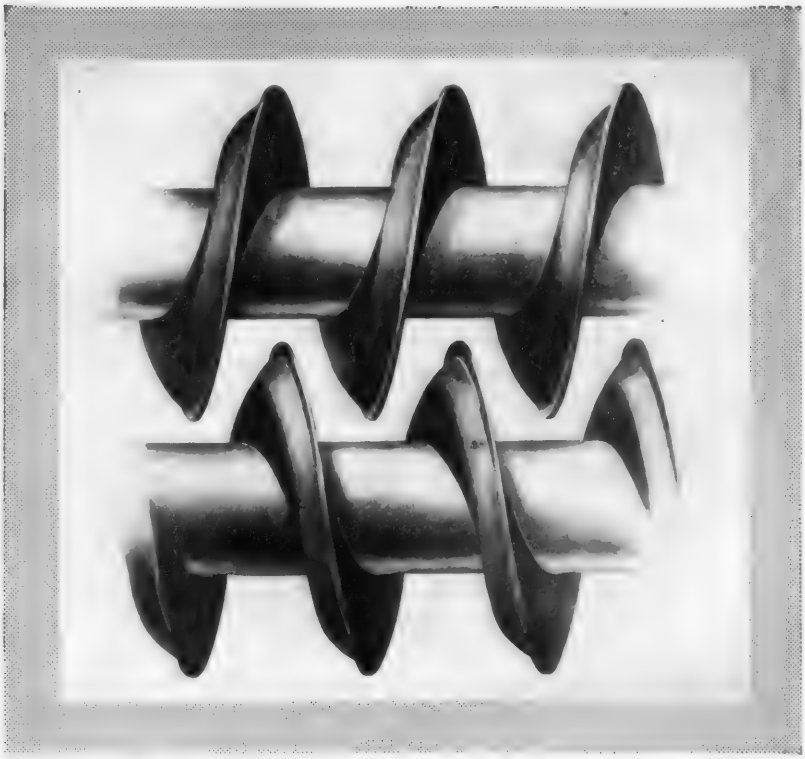

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Processor

a continuous heat exchanger

* **Highly efficient heat transfer.**
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The 'Holo-Flite' Processor is a screw conveyor with hollow flights through which a heat transfer agent is circulated. The material to be processed can be either heated, cooled or dried at a continuous uniform rate. The basic design of the 'Holo-Flite' Processor can be readily adapted for specific applications; for example a dome cover can be fitted to collect evaporated moisture in a drying process.

One of two 'Holo-Flite' Processors, Model 1D78-4", supplied to Imperial Chemical Industries Limited.

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such as you've never had before!

At last, a complete packaging service conceived with the packer—*and his sales*—in mind. At the Jackson Glassworks millions of glass containers are being produced every week; many of them are, of course, standard containers, but a great number are special containers—special because they are *new types of containers* designed to improve appearance and to facilitate high speed packaging.

This is the Jackson idea of a Packaging Service—a service that produces containers with the product, the closure and the outer in mind, and at Jackson's two important new departments are working to ensure that the company and its customers keep well to the fore in modern packaging methods. If bottling or packing is *your* business here is a name worth remembering.

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A comprehensive service embracing design and advice not only on glass containers but also on closures, labels, display boxes and outers. Ring Museum 7263 with any problem you may have.

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A team of experts, perfecting new types of glass packs and closures. If you have a new product or want to give a new look to an existing one, we may already have the answer for you.

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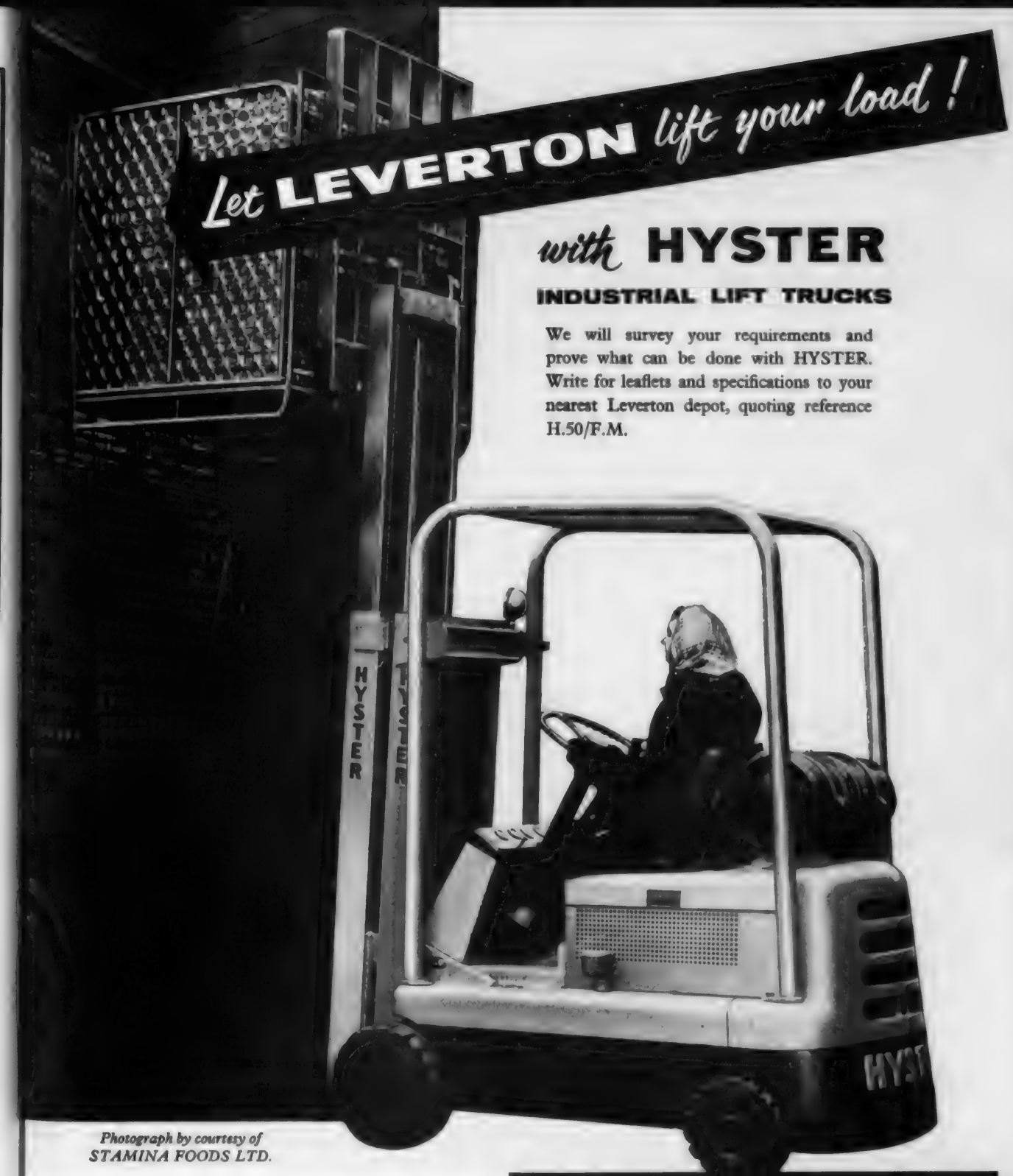

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...SAYS THE SALES MANA

To-day, hundreds of leading firms regard R.O. Seals as first-class sales aids and as a means of establishing good trade and public relations. For instance, being printed in colour they greatly improve the appearance of a product and act as a visual link between its appearance in advertising and its display in the shops. And because R.O. Seals offer security with ease of opening and re-closing there is an instinctive public preference for them. But that is not all. Safeguarding the freshness and purity of the contents throughout all stages of distribution is vital and no closures do this more effectively than R.O. Seals. Every cap is thread-moulded to each individual container so that a perfect made-to-measure hermetic seal is assured. It will pay you to consider R.O. Seals in relation to your product. Full details gladly sent on request.

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Modern Butchers' shops use clean, hygienic 'Darvic'

There is a lot of 'Darvic' p.v.c. sheet in this butcher's shop. The top and sides of the counter, the sides of the wooden topped meat chopping counter, and the door and wall of the cold room are covered with this hygienic I.C.I. material. 'Darvic' panelling means that customers are attracted by a clean shop which can easily be maintained in good clean condition.

'Darvic' is an hygienic and odourless material that will not taint food. It is tough yet light and is rigid even in thin sheets. 'Darvic' has low thermal conductivity, has high impact strength and resists corrosion. 'Darvic' is easily heat shaped and is available in a wide range of attractive colours.

'DARVIC'

'Darvic' is the registered trade mark for the rigid p.v.c. sheet made by I.C.I.

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ALLOA GLASS

THE ALLOA GLASS WORK CO. LTD., GLASSHOUSE LOAN, ALLOA, SCOTLAND. TELEPHONE: ALLOA 761

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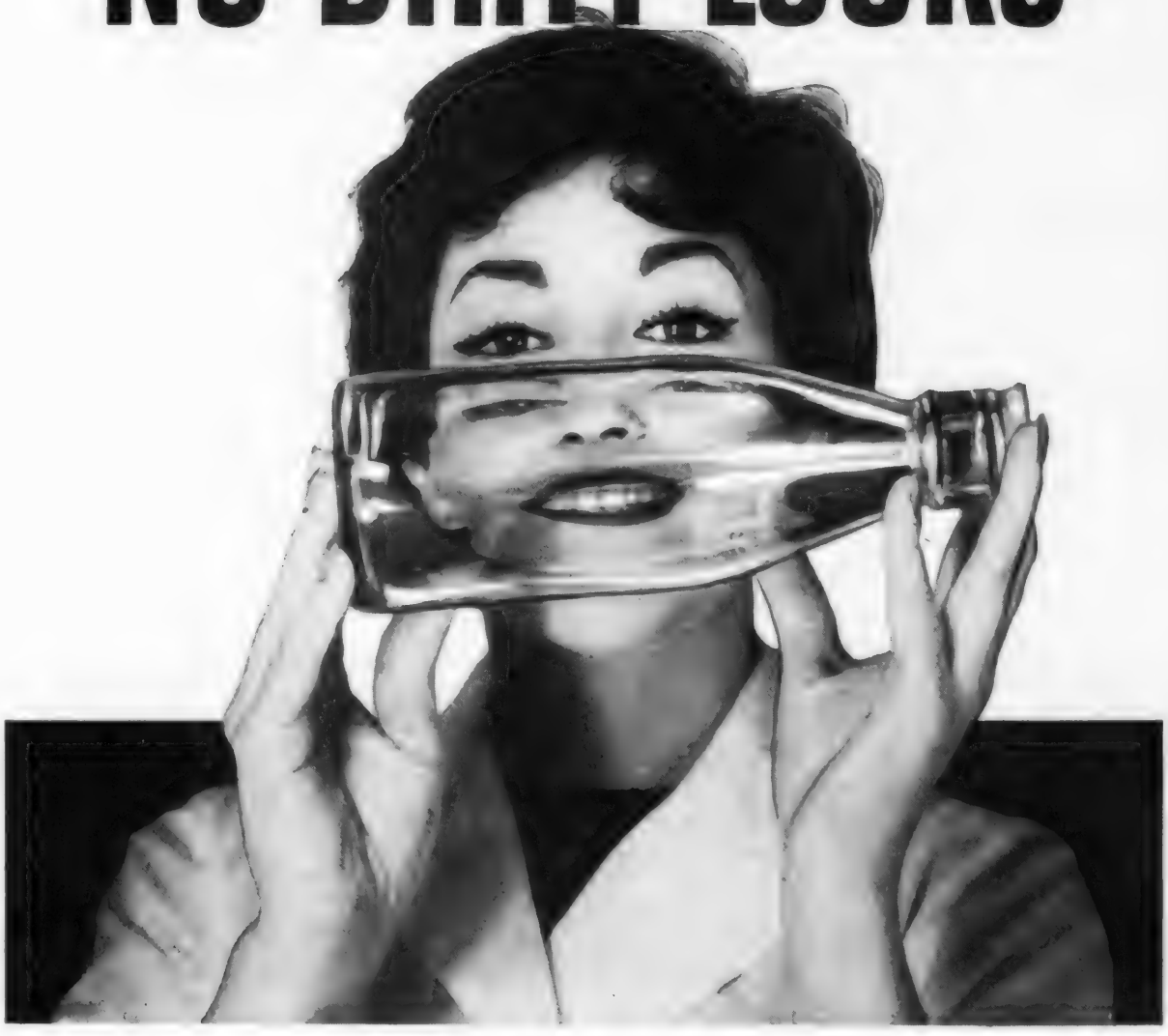

Permutit softened water ensures:

- Sparkling bloom-free clean bottles
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Permutit Fully Automatic and Manually operated Softeners are available to soften any volume of water.

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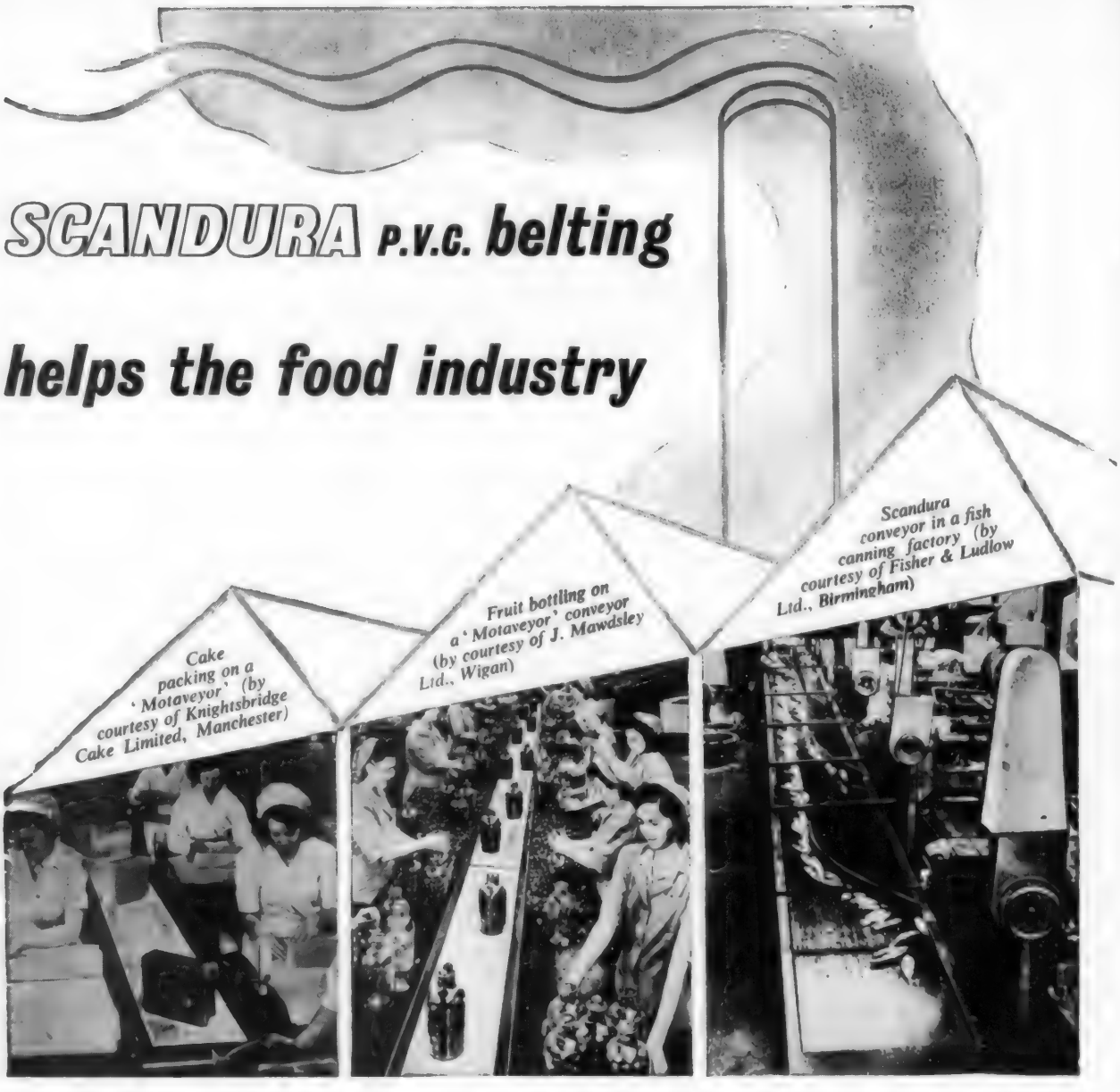
SCANDURA P.V.C. belting

helps the food industry



Cake packing on a 'Motaveyor' (by courtesy of Knightsbridge Cake Limited, Manchester)

Fruit bottling on a 'Motaveyor' conveyor (by courtesy of J. Mawdsley Ltd., Wigan)

Scandura conveyor in a fish canning factory (by courtesy of Fisher & Ludlow Ltd., Birmingham)

As the pioneers of P.V.C. covered conveyor belting British Belting & Asbestos have supplied their SCANDURA belting for many varied applications. Due to its resistance to contamination and its hygienic qualities SCANDURA has become the obvious choice for food conveyor belting. Its lasting qualities had already been proved in food factories two years before its first introduction in Britain's coal mines in 1948, and its fire resistant properties have brought a hitherto unknown safety margin where conveyor fire hazards originally existed. SCANDURA is available now, in varying widths and thicknesses to suit all applications.

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That's it—game and set!
Now, who's ready for
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Who *isn't!*—especially when it's
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'Squash' manufacturers
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to give added piquancy of
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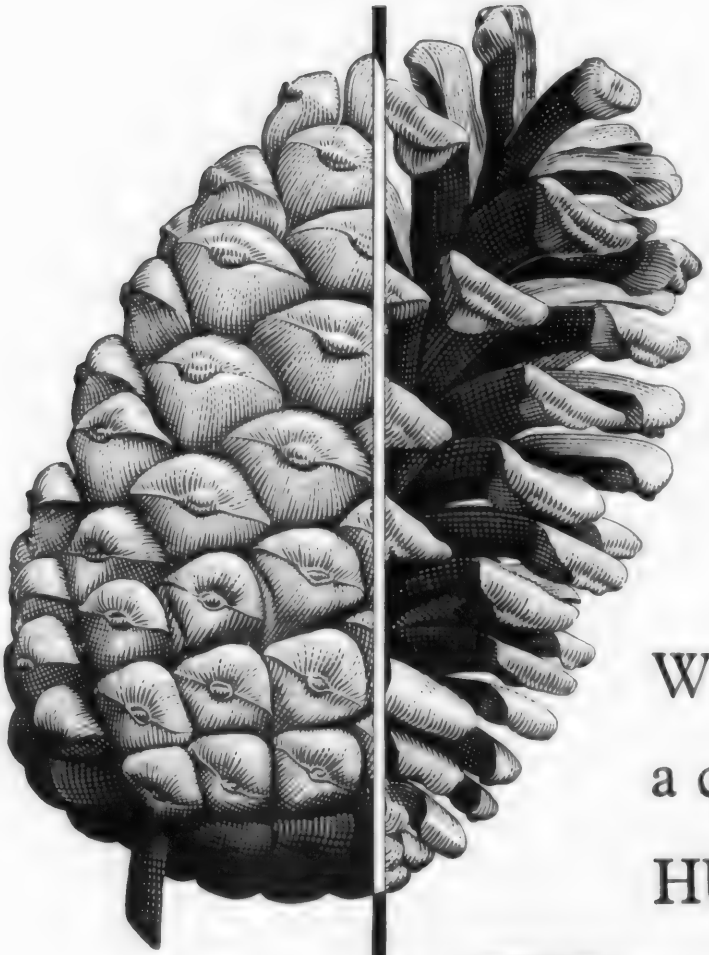

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a question of
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Manufacturers of instruments for the indication, recording, controlling of:— Temperature, pressure, liquid level, volume specific gravity, humidity, etc. Also meteorological and aircraft instruments.

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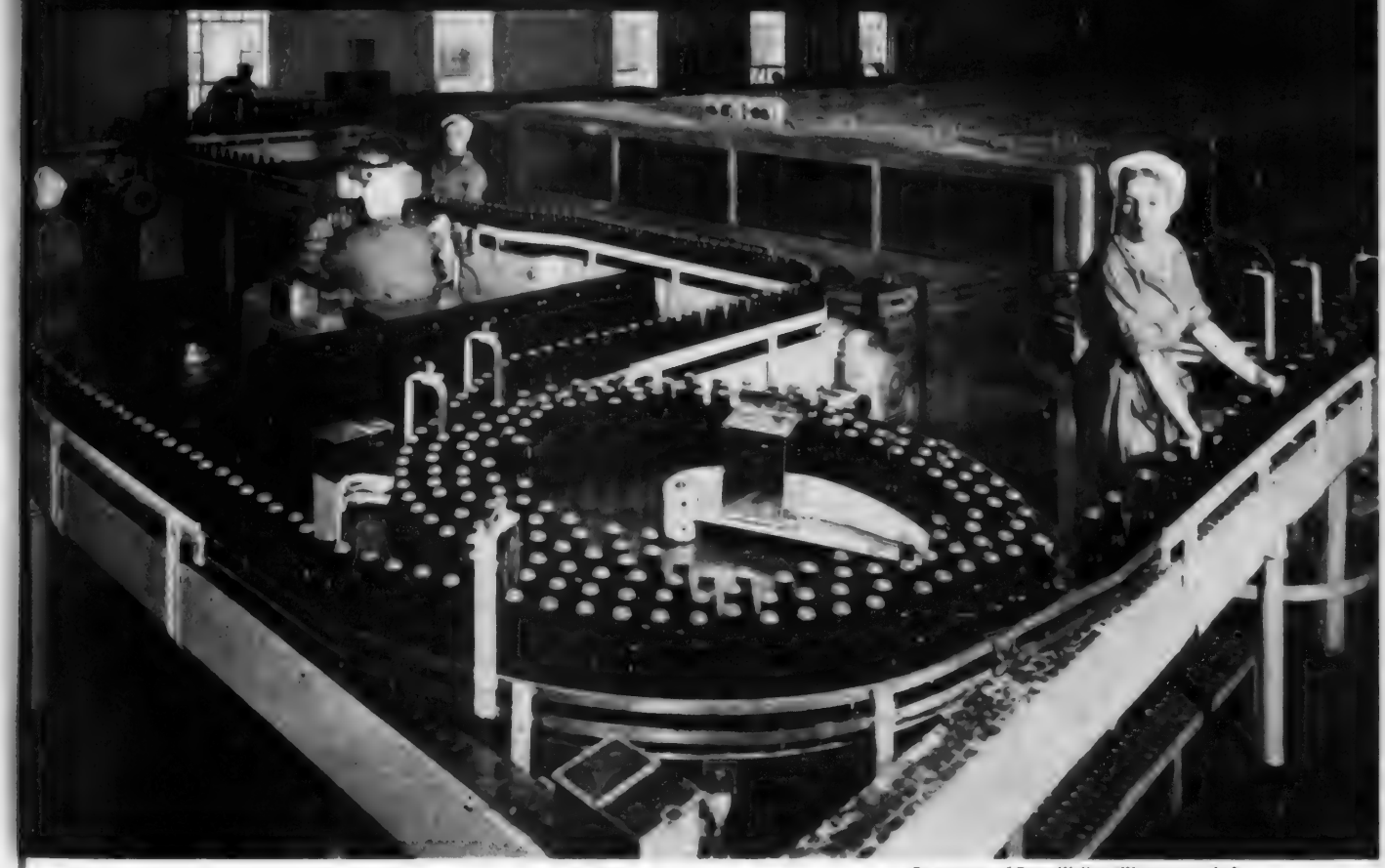

By courtesy of Peter Walker (Warrington) Ltd.

BARRY-WEHMILLER

Rotary Filer

You get increased output with the B.W. Rotary Filer It steps up production, and saves labour.

If the machine ahead of the Filer stops the bottles will accumulate on the Filer table. They are automatically cleared when the machine starts again. There is no need to stop the Filer working. The Rotary Filer will handle varying sizes of containers.

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solves the world's bottling problems

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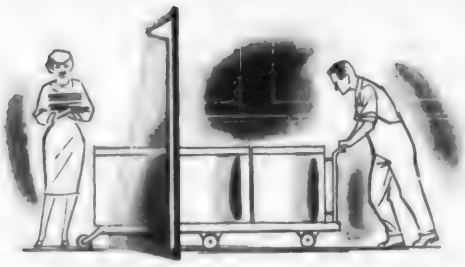
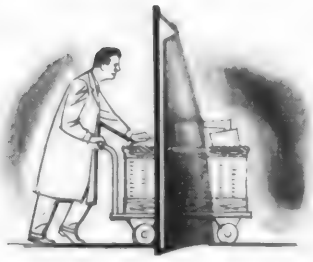
the safe



Safe because it is translucent, hygienic, allows easy passage for speedy handling of goods between departments where constant usage is necessary.



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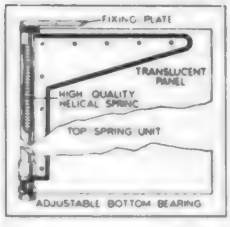
Flexible to allow wide manually operated trolleys to be used.

self-closing

door

Self-closing so that it cuts down draughts and noise.

The framework of the door consists of a vertical tube which fits close to the door frame. Concealed in the top of the tube is the patented double-action return spring, this is fully adjustable and ensures that the door is self-closing. The door pivots at the top and bottom on axles let into the lintel and into the floor.



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Translucent Doors

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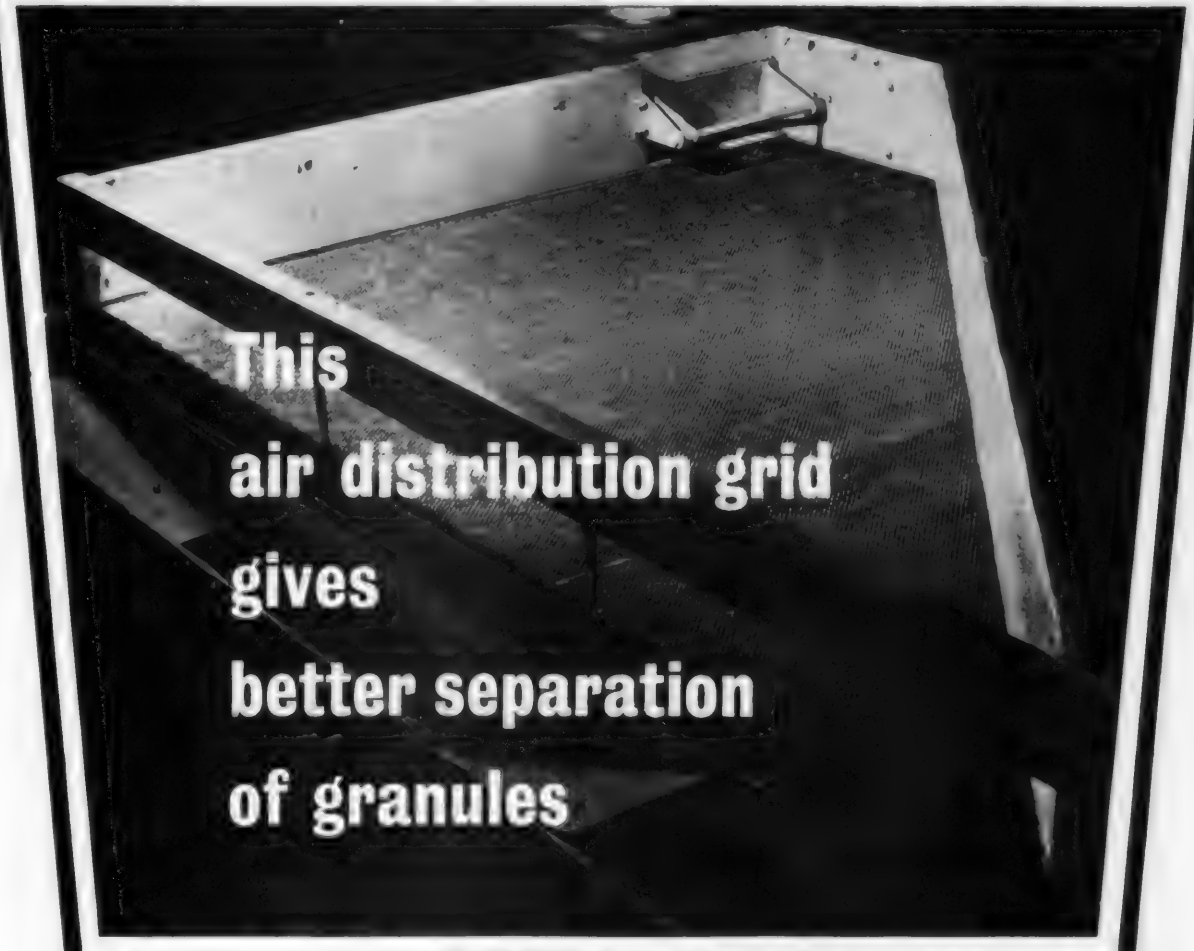
See Neway Flexible Doors at the Building Centre, 26, Store St., London, W.C.1, or write for free leaflet to the Manufacturers.

WILLIAM NEWMAN & SONS LTD. (Dept. FM) HOSPITAL ST., BIRMINGHAM 19.



This air distribution grid gives better separation of granules

The VIBRAGEM Densimetric SEPARATOR

On the new Vibragem Densimetric Separator a close-mesh wire grid has been placed between the filtered air supply and the work screen on which the stock is graded. It's there for a vital function - to ensure the uniform distribution of air that is essential to really efficient separation. The result is a near-perfect separation of all granular products of closely-related specific gravity, permitting simultaneous classification, grading, removal of stones, and purification.

The Vibragem handles all granular materials. Conclusive official tests have been carried out on the separation of :

1. hard wheat and barley
2. selected soft wheat
3. selected maize hybrids
4. malted and un-malted barley
5. all farm and field seeds
6. all pot-herb seeds
7. all flower seeds
8. wheat germ and bran
9. maize germ
10. cocoa shells

These materials can also be treated: almonds, beans, peanuts, ceramic materials, chicory, wood-shavings, clover, coffee, cork, flax, hemp seed, lentils, oleaginous seeds, peas, raisins, rice, salt, sand, sawdust, etc.

Examples of capacity: Vegetable seed mixtures can be separated and classified at 800 lb. an hour, and hard wheat and barley mixtures up to 3,300 lb. an hour. Let us test and report on your own products in our experimental laboratories. Send for details today.

HS349

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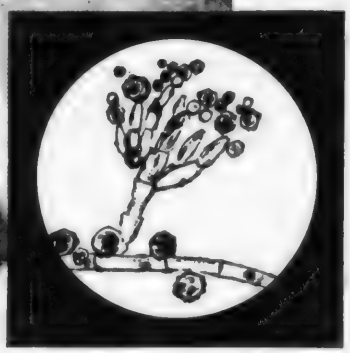

Scopulariopsis Brevicaulis: a mould which liberates arsine from the pigment Paris Green—grown on Oxoid Sabouraud Agar.

The case of the toxic wallpaper

In a damp and dingy green-papered room, a man was suffering from a progressive malaise and little knew that he was being slowly poisoned. Murder?—No. In fact, arsenical gas was being liberated from the green pigment in the paper by the action of a mould growing on it.

Although this particular instance is not taken from our files, it serves to illustrate the diversity of problems which face the Bacteriologist. It is with such problems—as well as in the everyday routine work—that Oxoid Culture Media prove so dependable and reliable and, of course, so convenient.

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The use of Oxoid Culture Media ensures constant quality and uniformity in your laboratory technique. Absolutely reliable, quick, convenient and economical, Oxoid Culture Media are available in tablet or granular form. Full details from:

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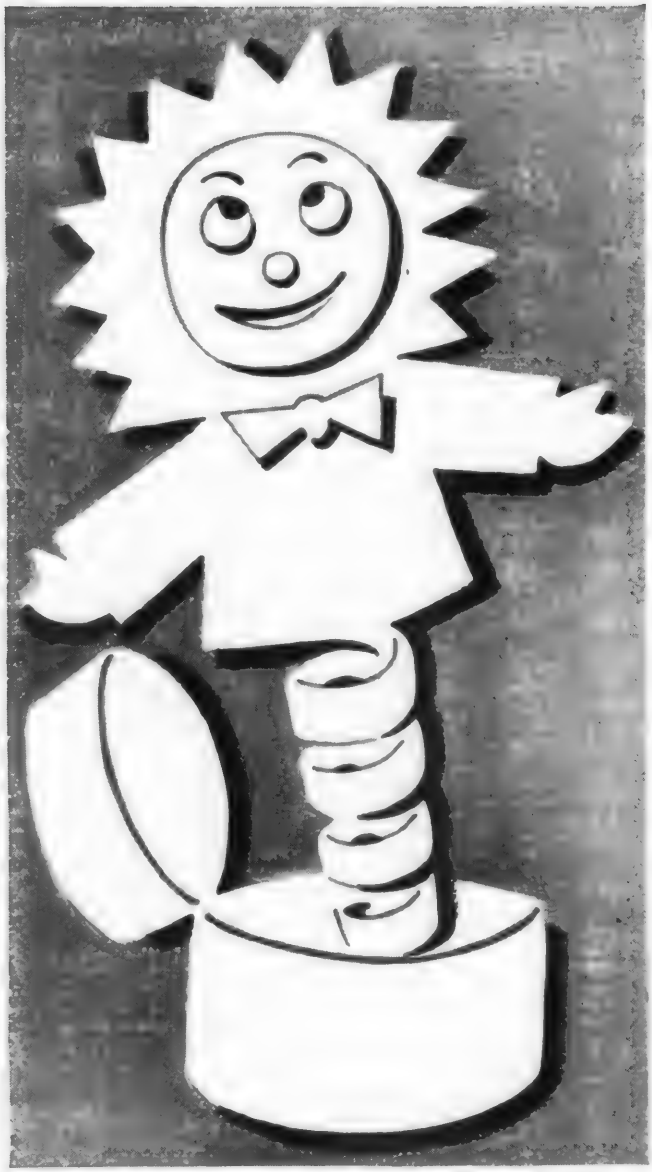

Surprise packet

There are two sorts of surprises: the nice ones and the other kind. Box-taint belongs to the latter category. Avoid it one must when packing sensitive products. It is not surprising, therefore, that wise box-makers choose SCANDINAVIAN pure folding box board. For SCANDINAVIAN, made only from virgin spruce wood pulp, has all the most desirable properties and *none* that could taint the most sensitive product. It combines lightness and whiteness with remarkable rigidity and an excellent printing surface. And (pleasant surprise) it's not so expensive as you might expect. Ask for details.

SCANDINAVIAN

PURE FOLDING BOX BOARD

'SCANDINAVIAN' PACKING FOR SENSITIVE PRODUCTS
The name 'Scandinavian' guarantees a pure folding box board produced by the associated box board manufacturers of Finland, Norway and Sweden.

Ask your boxmaker or agents of the FINNISH, NORWEGIAN AND SWEDISH FOLDING BOX BOARD MILLS
OR WRITE TO THE INFORMATION DEPT., P.O. BOX 7232, STOCKHOLM 7

CVS 20

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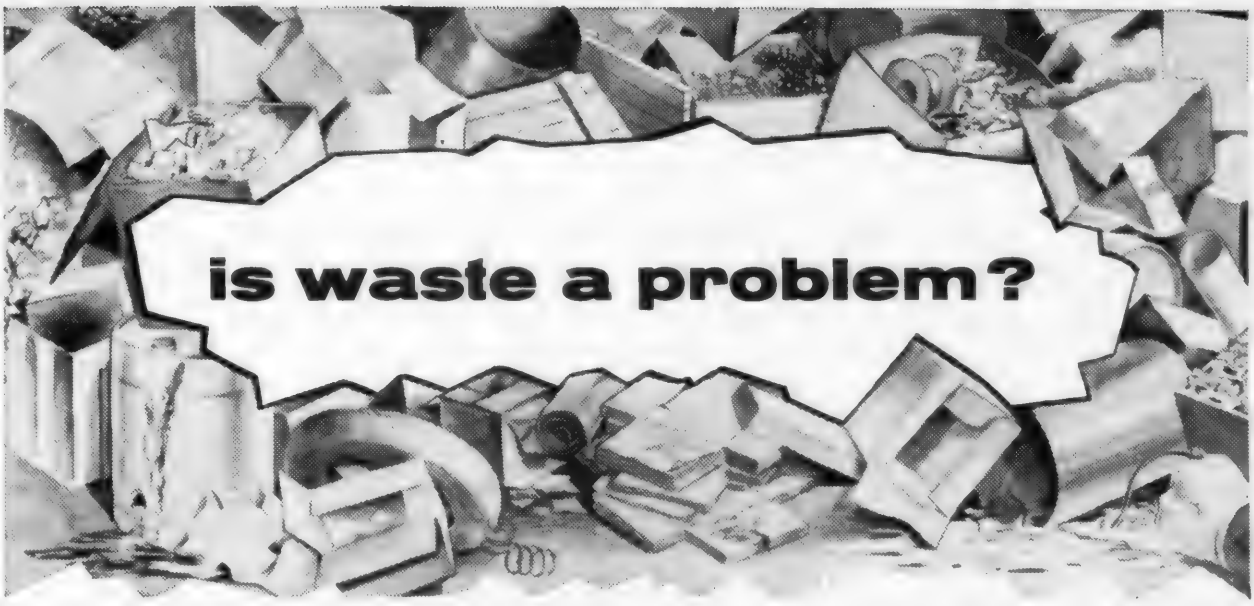

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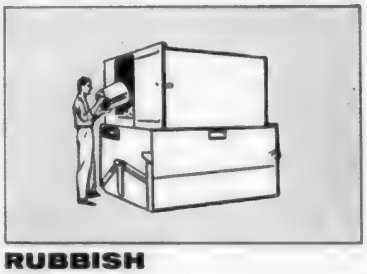
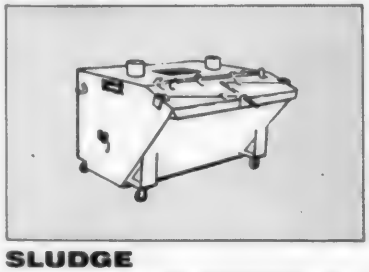
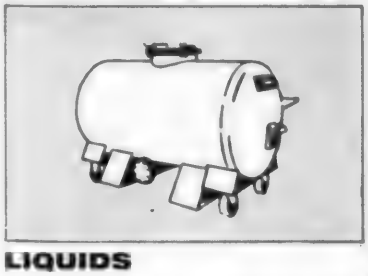
is the **NEW** *method of waste collection and disposal by*



RUBBISH



SLUDGE



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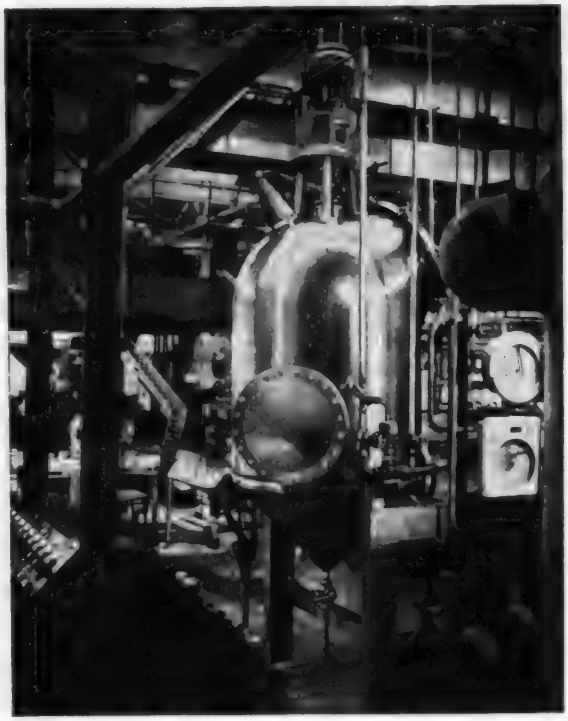

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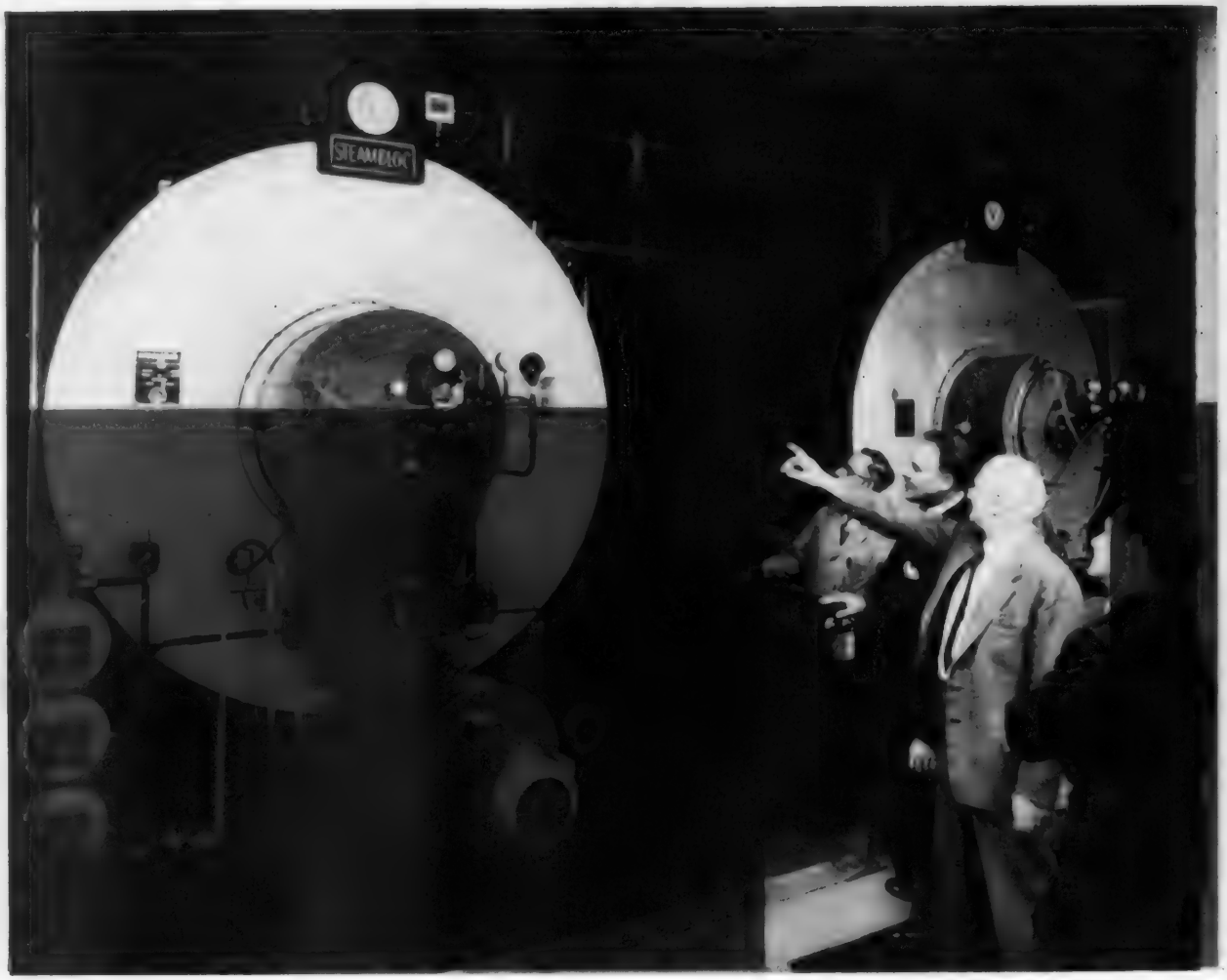

and this is our boiler room...

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for good examples

The photograph opposite shows the Steambloc installation at Messrs. Fullers Ltd. Other prominent Steambloc users in the world of foodstuffs include: Batchelors Pure Foods Ltd., Campbells Soups Ltd., Cow & Gate Ltd., Express Dairy Co. Ltd., Kellog Company of Gt. Britain, Nestlés Ltd., Tate & Lyle Ltd., United Dairies Ltd., and T Wall & Sons Ltd.

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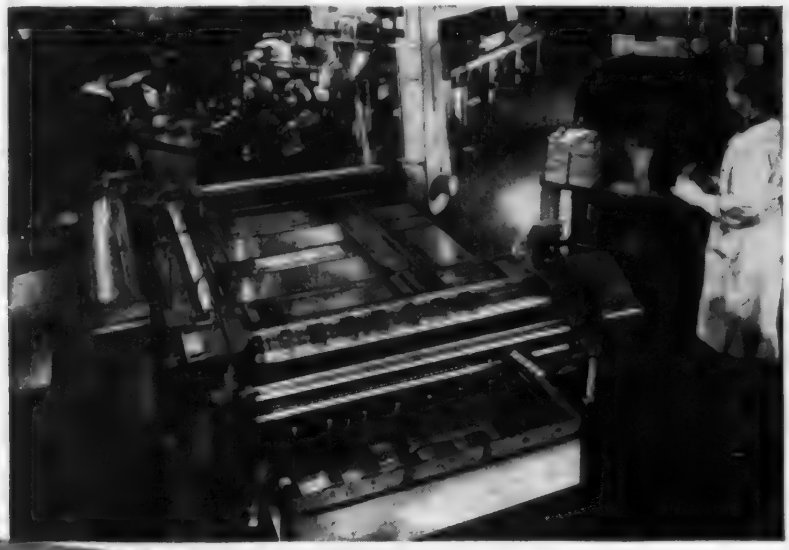
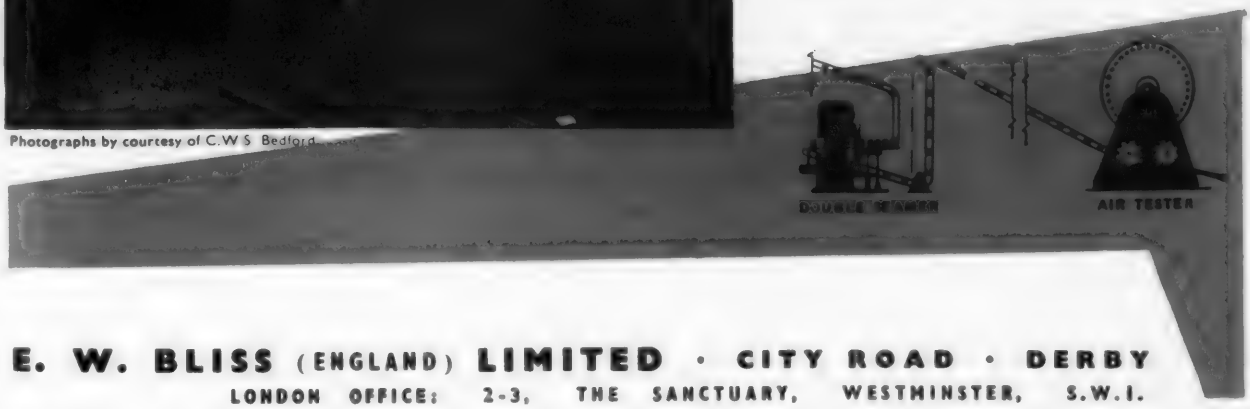


Photographs by courtesy of C.W.S. Bedford

E. W. Bliss (England) Limited are manufacturers of high speed canning lines and have installed much of the can making machinery used in the new Kitt Green factory of H. J. Heinz Company Limited.



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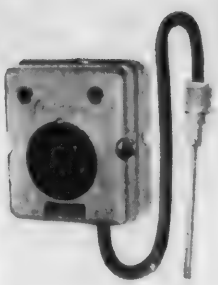

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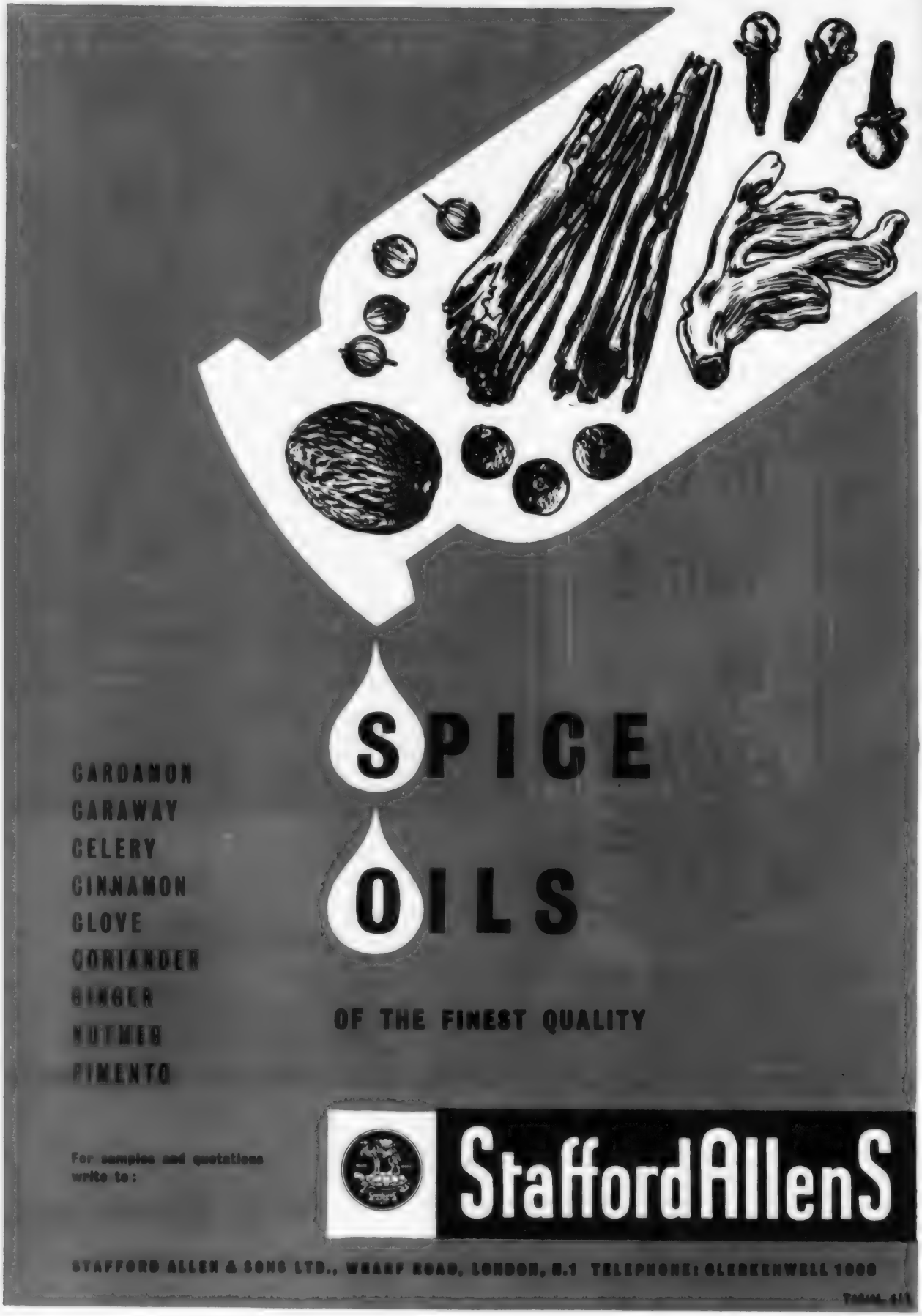
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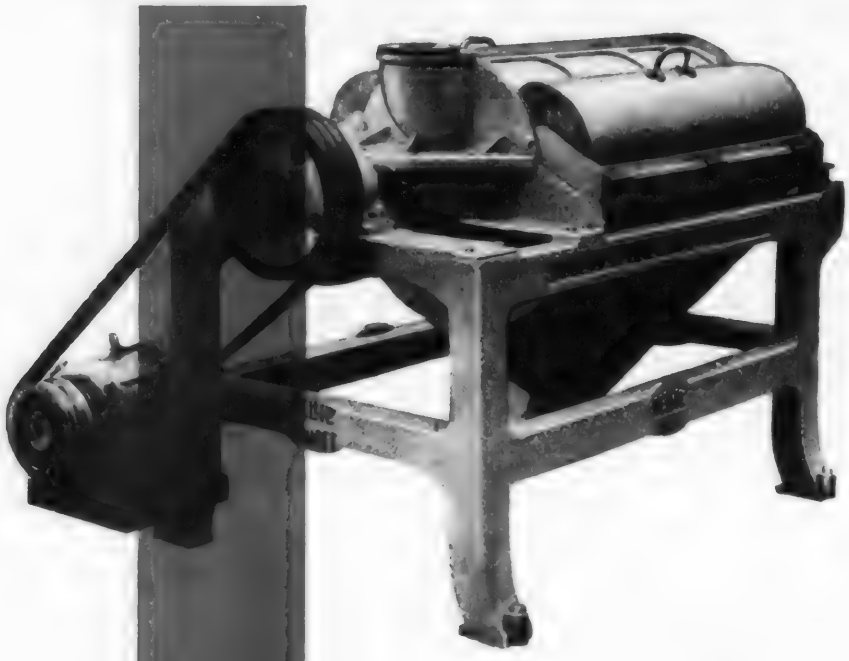

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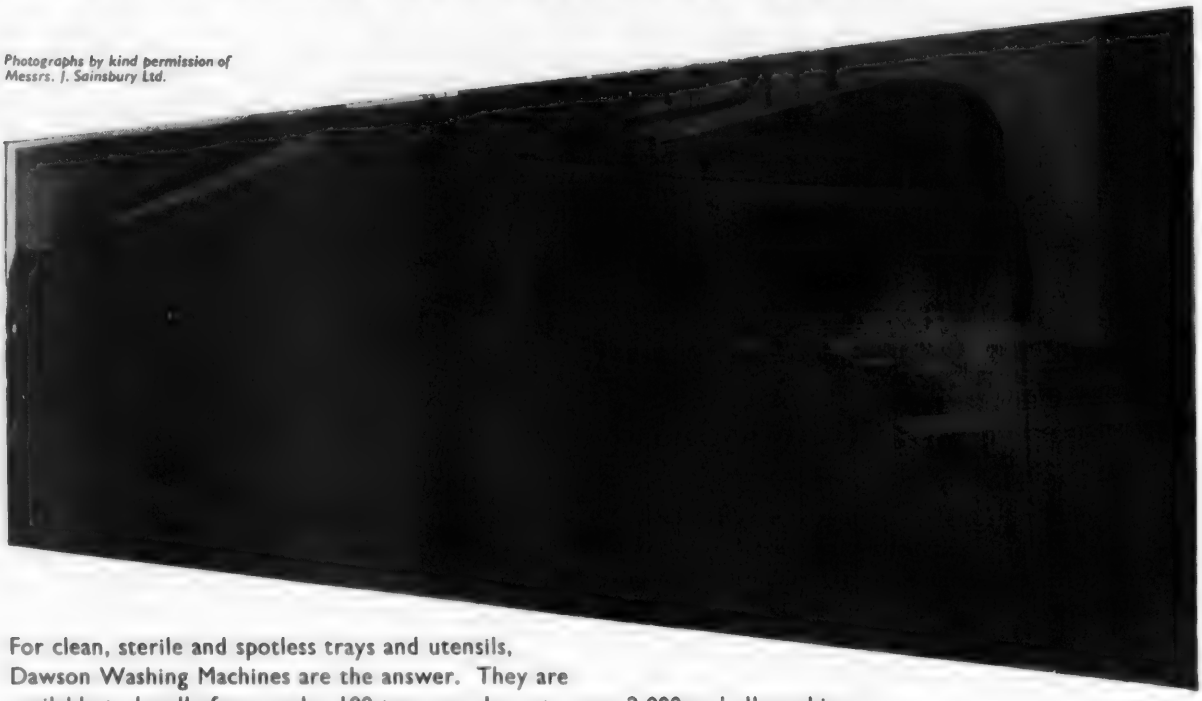

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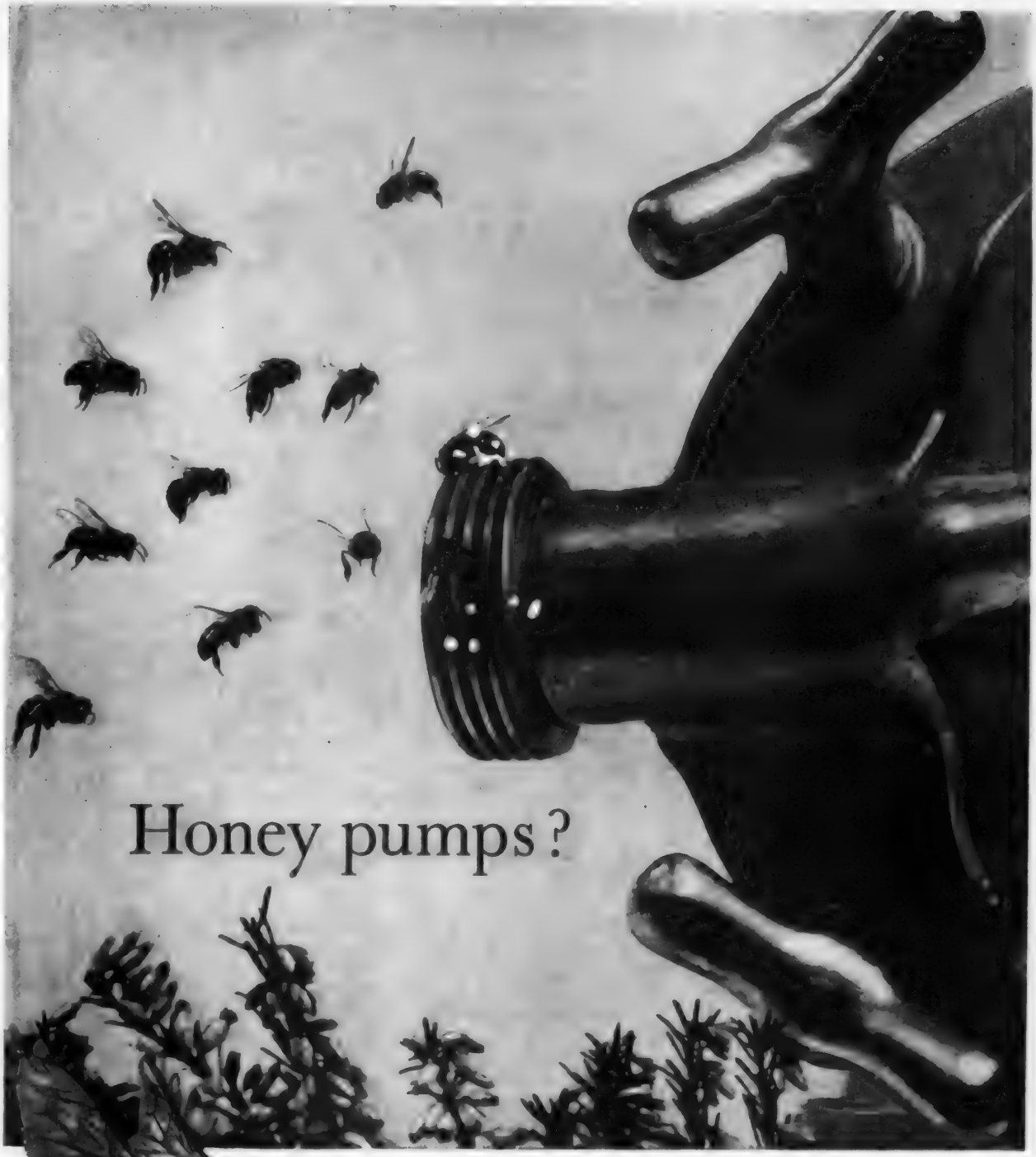

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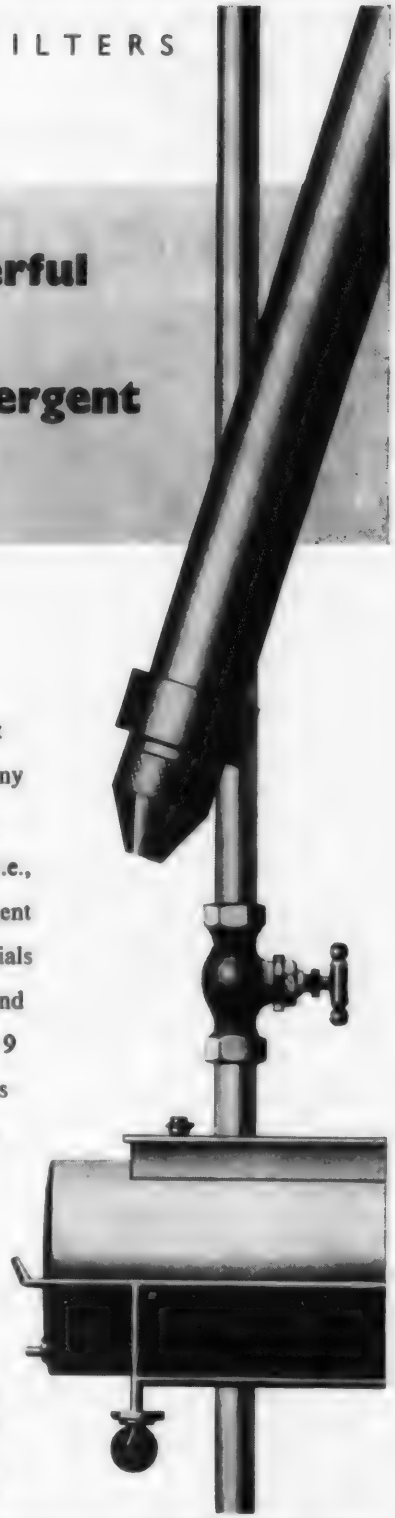

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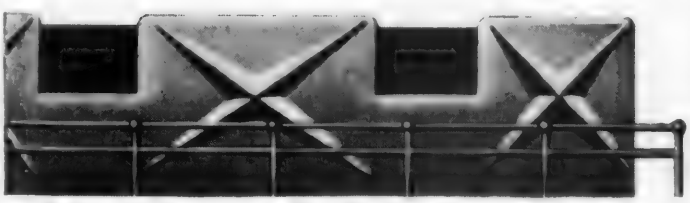

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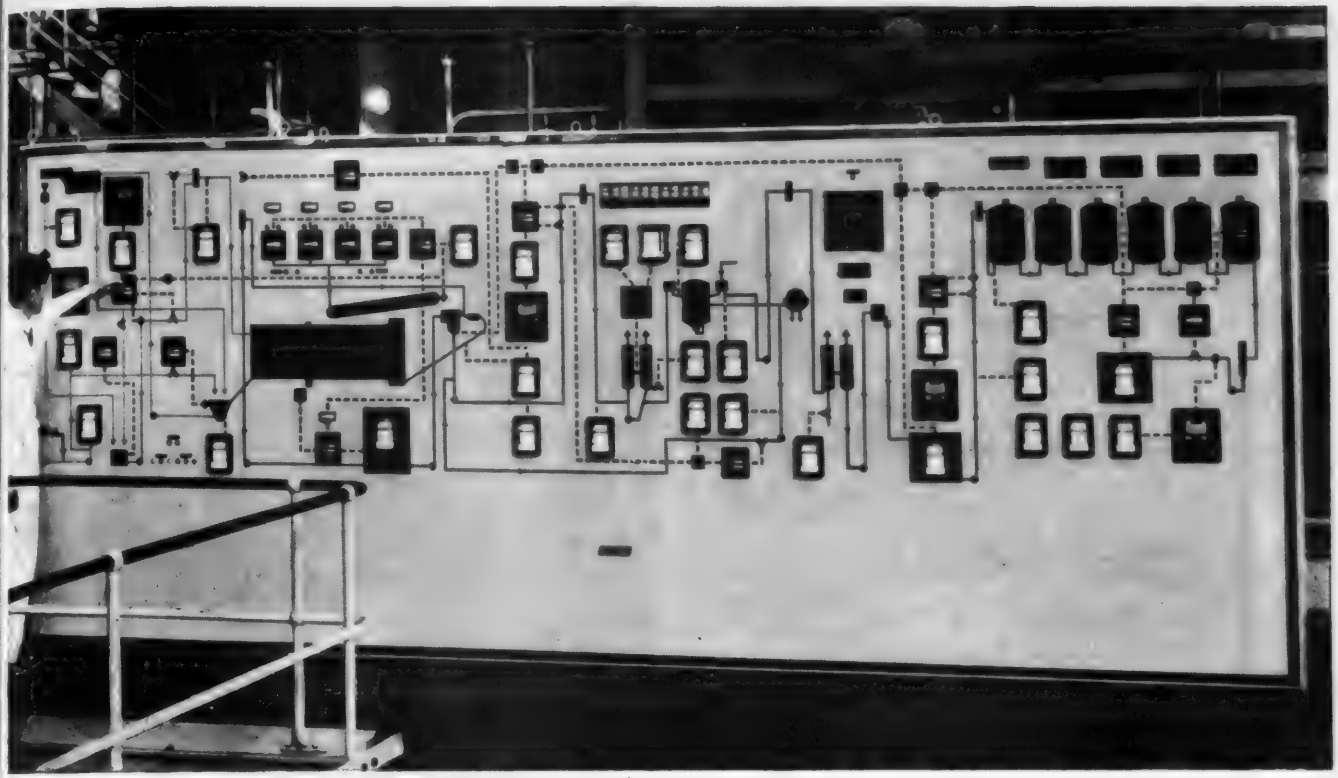

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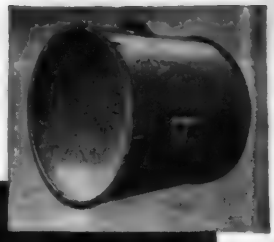
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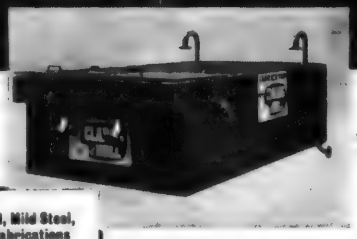
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FOOD MANUFACTURE

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The Examination of Edible Oils & Fats (No. 2)

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This advertisement is one of a series of Information Bulletins issued by Loders & Nucoline Ltd. Copies are available, together with a folder, on request to Loders & Nucoline Ltd., Unilever House, London, E.C.4.

PEROXIDE VALUE

Definition : *The peroxide value is a measure of the peroxides contained in the oil or fat expressed as milli-equivalents of peroxide oxygen per kilogram of sample.*

When oils and fats are subject to oxygen absorption there is a small but steady increase in the oxygen uptake as measured by Peroxide Value until a point is reached when the rate of oxygen uptake is materially increased. The time to reach this point is referred to as the Induction Period and is considered to indicate the stability of the product under test. As determinations of induction periods are carried out under conditions of accelerated oxygen absorption, i.e. at high temperatures, there is some doubt as to whether induction periods are really indicative of shelf life, as in many cases there is little correlation with keeping trials carried out under normal storage conditions, or, for that matter, with normal keeping trials of resultant products.

Peroxide Value determinations have been used to assist in the selection of suitable antioxidants whose activity may be assessed by the length of induction period obtained when these are incorporated. There is still a lack of tie-up between chemical testing, i.e. induction periods from peroxide measurement, and assessment of flavour deterioration or as it is usually described, organoleptic testing.

NOTE: The Lea Value which is often mentioned, is an expression of peroxide value in millimoles of peroxide oxygen per kilogram; therefore numerically the peroxide value as defined is twice as great as the Lea Value. There has been much confusion about the way in which peroxide values and Lea Values are expressed, but the definition given above is becoming universally accepted.

DETERMINATION OF VOLATILE ACIDS

Definitions: *The Reichart Value is a measure of the water-soluble steam volatile fatty acids present in an oil or fat.*

The Polenske Value is a measure of the water-insoluble steam volatile fatty acids present.

The Kirschner Value is a measure of the water-soluble steam volatile fatty acids present which form water-soluble silver salts.

These processes do not determine the total quantities of steam volatile fatty acids present and hence are merely empirical values, but by strict adherence to the dimensions of the apparatus used and details of procedure, they afford useful information as to the presence or absence of certain fats in a mixture.

All the values are concerned with the presence of short chain fatty acids in a fat and are applicable to butter fat and coconut and palm kernel oils. Butter fat and other milk fats are unique in possessing glycerides containing Butyric Acid $CH_3(CH_2)_2COOH$ and as this acid is water soluble high Reichert Values are obtained. Insoluble volatile acids are practically absent from these fats and hence Polenske Values are very low.

With Coconut and Palm Kernel Oils, however, the picture is somewhat different—these oils contain both soluble and insoluble acids and therefore significant Reichert and Polenske Values are obtained; they do not, however, contain Butyric Acid.

The Kirschner Value is practically specific for Butyric Acid and is of value in indicating whether other fats containing volatile acids (e.g. Coconut, Palm Kernel) have been added to Butter and other Milk Fats.

It must be emphasised that the tests are empirical and the results, unlike the Saponification and Iodine values, are not additive, but a fair approximation of the presence of Coconut and Palm Kernel oils in a mixture in which butter fat is absent may be obtained by considering the sum of the Reichert and Polenske Values.

LN 58-8958

FOOD MANUFACTURE

Vol. XXXIV, No. 11 November 1, 1959

Enzymes in industry

THE production of tailor-made enzymes for manufacturing purposes is a challenge which chemists must take up, said Dr. F. J. Wilkins, deputy managing director of Glaxo, at the symposium held recently by the S.C.I. Food Group in London. The symposium was entitled "Enzymes in the manufacture, storage and distribution of food," and to judge by the packed attendance and the number of overseas visitors was an unqualified success.

The 2-day session was opened by an introductory review of the whole field by Dr. M. Dixon, reader in enzyme biochemistry at Cambridge; at least one listener was considerably more knowledgeable at the end of his short but comprehensive survey than at the beginning, and to judge by the approving comments, he was not the only one. The importance of these ubiquitous substances can hardly be exaggerated, for food in the first place is made by enzymic biosynthesis. So far, no enzyme has been synthesised, and all are obtained from living cells. Some 700 are already known, and the total number may well turn out to exceed 2,000. Each catalyses its own specific reaction, but the enzyme reactions important in food technology are small in number compared to the total.

Cheesemaking, breadmaking, brewing, the clarification of fruit juices, glucose production—these are only a few of the processes based on enzyme reactions. Some of the subject matter was highly specialised, and at times we felt that our task must be to gather what crumbs we could from the tables of the masters. Some of the crumbs were rather unexpected; we learnt, for example, that the housewife in the U.S.A. tenderises her tough joints by spraying them with an enzyme preparation from an aerosol dispenser. On the commercial scale, meat is dipped in an enzyme solution before being frozen.

Someone asked the obvious question—what happens to such meat if the housewife forgets to put it in the refrigerator or keeps it overlong at home? Dr. Underkofler, who had crossed the Atlantic to present two papers, set his listeners' minds at rest by explaining that the tenderising enzyme acts only in the early stages of cooking, and hardly at all at room temperature.

He also mentioned some promising experiments in Canada in which tenderising enzymes were intravenously injected into the animal immediately before slaughter, thus ensuring a much greater diffusion into the muscular fibres than could be achieved by dipping.

Surface culture methods for the commercial production of enzymes have now largely been displaced by submerged culture methods, except in the case of surface culture on solid media such as wheat bran. These methods began to be used about 10 years ago, and advances since then lead to the belief that the hope of tailor-made enzymes may not be so very long in fulfilment.

Food in tubes

THE ingrained conservatism of the average Briton (in food packaging as well as in politics) causes him to be mildly surprised when he goes abroad on holiday and finds he can buy butter and cream cheese in squeeze-tubes and mayonnaise in aerosol cans. Nestlé's milk, Colman's mustard, and one or two others are, as far as we know, the only collapsible tubes of food produced here, although imported foreign packs of this kind are seen more and more in the shops, which should help to break down sales resistance among those who associate tubes with toothpaste and aerosols with fly killers.

Certainly it is not the fault of the manufacturers that more use is not made of these newer ideas in packaging. The recent packaging exhibition displayed a variety of these packs waiting to be exploited, and one manufacturer we spoke to complained bitterly that although every conceivable specification could be met, the response from the food industry had so far been practically nil.

We learn that in this country collapsible tubes for all purposes account for less than 1% of packaging sales, and whereas the average yearly usage of tubes per head of population here is under six, in France and Italy it is about 12, of which half are for food. In the vanguard of the users of these convenience packs, we should imagine, are railway and airline caterers, whose needs in the matters of simplicity and weight-saving have brought forth many good ideas which have found wider application.

And to complement the aerosol enzyme mentioned in the preceding paragraph, we learn that one of the U.S.A.'s most recent developments in aerosol foods is a grease-free frying agent which is sprayed on to the pan and which allows omelettes, pancakes and similar things to be "fried" without fat or oil.

World Crops' first ten years

To our associate journal *World Crops* we extend congratulations on reaching its tenth birthday, and best wishes for the future. What changes have been seen in the world of agriculture in these last ten years! As in other fields of human activity, the most striking change has been the acceptance of new machines and new methods in places where for centuries traditional ideas have continued unchanged—one might almost use the term stagnated.

In this world revolution, *World Crops* has played its part in giving prompt, world-wide publicity to new inventions, machines and materials through its regular features "Machinery and Equipment" and "Agricultural Chemicals" and in its original articles by leading authorities on a wide variety of subjects. The journal began as a result of a conversation between two farmers, one also a publisher and the other an advertising agent. They were commenting on the absence of an international journal covering the business of the wholesale seedsman, about which little was known because they were so few in number and they indulged in little publicity.

But obviously the scope had to be wider if the journal was to be a success, so Leonard Hill and his friend, Bertram Ward, considered the idea of a journal for the working farmer and the scientific agriculturalist which would intepret the results of agricultural research and introduce to them and to specialist research workers in related fields new machines and new materials.

The idea of such a journal was warmly received by many knowledgeable and famous scientists, and the former Director of Rothamsted Experimental Station, Sir E. John Russell, probably the greatest agricultural scientist of his day—and who also contributes an article to the birthday number—wrote the foreward on the first page of the first issue. About this time, Leonard Hill, a past chairman of the Agriculture Group of the Society of Chemical Industry, met a member of the society, the late Sir Harold Tempany, C.M.G., C.B.E., D.SC., F.R.I.C., who had recently retired from the position of Agricultural Adviser to the Colonial Office, and was delighted to find that he was willing to undertake the momentous task of being its first editor.

To *World Crops*, then, we wish "Many Happy Returns" and continued success in its task of bringing enlightenment to growers.

No more "staff of life"?

BREAD is still a staple item in the U.S. diet, but it may perhaps be said that the part which it fulfils no longer entitles it to be called the "staff of life." It is merely the vehicle for spreads, sandwich fillings, and other carriers of flavours. It has to be anæmic in flavour so as to be unobtrusive in the manner of a well-trained servant.

These points of view were put forward by Loren J. Sjöström, the head of a laboratory devoted to flavours, when he addressed the annual convention of the American Association of Bakery Engineers in Chicago earlier this year. Mr. Sjöström, whose subject was flavour recognition in baked foods, believed that today's white bread in the States is a mixed blessing for its built-in properties may have served to suppress its potentialities of flavour and texture.

The speaker concluded that the position of bread and crackers had interchanged during the past few years; bread becoming a bland product requiring something to give it a flavour and make it appetising, while crackers, by virtue of the addition of cheeses, herbs and other flavouring agents had become almost completely self-sufficient.

An interesting reflection of the present trend was Mr. Sjöström's reference to "partially baked rolls" and other specialities gaining in importance as they filled the customers' unconscious demand for the flavour of home-made bread.

Every eater is potentially an experienced critic of flavour; at least, the majority consider themselves as experienced authorities on the subject. From there he may come to reflect that flavour and quality mean much the same thing.

Boxes bigger than they should be

ABOUT this time of the year, cardboard boxes in exotic shapes and colours are often sent to the editorial office. These are samples of manufacturers' Christmas retail packs, and are, alas! usually empty. We recently received one such packing case full of selections of the boxmaker's art, some of great size and elaborate beauty. One particular creation with a domed lid and a flared base would have held pride of place in any sweet-shop window. The passer-by would have been excused for thinking that within its supposedly cavernous interior, several pounds of chocolates would be contained. Now we were not born yesterday; familiarity with the ways of the world have bred a slightly cynical tolerance of containers that hold less than one might at first sight think—beverage bottles whose sharply conical bottoms reduce their capacity by a third (to allow the dregs the better to settle, we are told),

cartons of cream with bases that are nearly halfway up the sides.

All these are long familiar; but we were not quite prepared for the diminutive cargo space inside this particular chocolate box when we opened it. The capacious domed lid was flat inside; the large flared base was but a massive buttress for a small inner container.

We do not in the least suggest that such elaboration is dishonest. The weight of contents is clearly marked, and if a pound box of chocolates can be artfully made to look larger than life, no harm is done if the customer is warned. But in a speech before the National Confectioners' Association convention in the U.S.A. recently, FDA Commissioner George Larrick described the present trend to deceptive packaging as disturbing. There is, said the commissioner, a tendency to pack candy (sweets to Britons) and some other foods in larger containers than are necessary: 10 oz. packs of chocolate mints in cartons designed to hold 1 lb. had been seized.

In America, it seems, some manufacturers are aiming so closely at the net-weight declaration on the package that consumers are often getting short weight, and in a recent survey of 206 lots of 35 different food products, 19% were short weight. Simulation and dissimulation are ever-present tendencies in frail human nature, which processors and packers must be on their guard against.

How to beat the lorry thieves

A LETTER from the Road Haulage Association shows that food tops a list of the kinds of commodity which are most frequently stolen from lorries while in transit. Indeed, it is by far the biggest single target of lorry thieves, being involved in 35% of the total number of thefts reported.

Thefts from goods vehicles, says the letter, are increasing to an alarming extent, and two-thirds of the total number of thefts occur in the London area. In the first six months of this year, the number of thefts of lorries or their loads in the Metropolitan Police District was 2,000 and their value was estimated at £275,000, a 25% increase on the 1958 figures. Nearly all the vehicles or loads stolen in London are stolen in the central area, near the docks and the big markets.

While the vehicles are usually recovered, most of the loads disappear without trace, to be disposed of through channels well developed by the highly organised gangs who run this contemptible trade. The pattern of thefts is largely dependent on the demand for different goods; thefts are not haphazard, but vehicles are carefully selected, and it is known that in many cases the disposal of a lorry-load has been arranged before even the vehicle is stolen.

As food manufacturers are among the biggest sufferers from this organised looting, they are well advised to take some simple precautions which have been proved to reduce greatly the likelihood of theft. Most vehicles are stolen while parked, usually at night but to an increasing extent during the day, and one of the most effective safeguards is the fitting of an immobilisation device by which the vehicle can be put out of action when the driver has to leave it unattended. Another necessary safeguard is the careful screening of employees.

Figures speak for themselves. One operator who sub-contracts part of his work fits security devices to his own vehicles but cannot persuade his sub-contractor to do likewise. In recent months he has suffered only five thefts from his own vehicles, while from the sub-contractor's lorries there were 450 thefts of his goods in the same period, even though he sub-contracts the smaller part of his traffic.

So, manufacturers be warned! If you run your own lorries, fit security devices; if you employ a haulier, put the screw on him to do the same.

It's hush-hush!

OUR associate journal *Manufacturing Chemist* has brought up the subject of trade secrecy, which probably causes the editors of technical journals more headaches than any other subject. The reluctance of some firms to part with information is extraordinary, particularly when in most cases the information cannot be classified in any sense as "secret," nor can we imagine that public disclosure would at all harm the firm concerned, rather the reverse, in fact.

One understands that firms like to be silent about certain output figures which might be of interest to competitors; certain processes, too, which a firm has developed might be best not disclosed in too much detail. But the air of mystery with which many manufacturers shroud quite simple processes is laughable. This secrecy mania frequently extends to the departments of a firm; a product of one department used as a raw material by another is coded with the intention, usually unsuccessful, of concealing the components from the workpeople.

More serious is that members of the staff are frequently prevented from publishing papers in scientific journals, and even quite junior employees are often forced to sign contracts which contain unjust restrictive clauses.

The rapid advance of technology means that products and processes are constantly developing and changing; anyone relying on pickings from other firms would soon fall behind. A company's real and most valuable secrets are the experience, competence and "know-how" of its executives and technical

staff, an intangible asset which cannot be put down on paper.

We recently had the experience, fortunately rare, of being welcomed at the factory of a well-known firm and spending nearly two days being shown what went on and compiling a descriptive article. Then the firm had second thoughts and withdrew permission for the project. We do not complain, for this is one of the occupational hazards of journalism. But it spotlights the difficulties which bedevil the attempt to print a coherent, accurate and complete record of the capacity, achievements and aspirations of a great industry. Thousands of people, here and abroad, depend for their knowledge of this industry upon the appropriate technical journals and judge its importance accordingly. The contrast between the reticence of British industrialists and the informativeness of American is too well known to need emphasis. The result is that the strength, versatility and inventiveness of American industry is projected all over the world. British industry has as good a story to tell and plenty of journals in which to tell it; a little more co-operation from the industry would work a minor miracle.

Instant mashed potatoes

AN idea rapidly catching on in the U.S.A. is "potato flakes"—dehydrated mashed potatoes which can be reconstituted rapidly by adding hot water or milk, with butter and salt as desired. The result is said to be equal to fresh mashed potatoes in taste and texture.

The product has been developed by the U.S. Department of Agriculture, and such uses for potatoes are expected to require upwards of five million bushels of potatoes annually. A high-quality product can be made, so it is said, from a wide variety of potatoes grown in different parts of the country.

To make potato flakes, fresh mashed potatoes are applied to the surface of a heated drum, where they are dried in a few seconds and removed as a thin sheet. This sheet is then broken into flakes and packed. A low-temperature pre-cooking stage allows the use of many low-solids varieties of potatoes and it has recently been found that cooling the potatoes after pre-cooking makes the process more widely applicable, even to potatoes with a solids content as low as 17%. The cooling stage also produces smaller flakes, and a greater weight can be put in each packet.

The process is spreading to Canada and Europe, and plants are being built at Munich, in Germany, and at Gmuend in Austria. Similar products have been on the market in this country for a number of years, but as yet there has been little indication that they have caught the public's fancy.

How to give up smoking

PRESS reports of a medical study which indicates that pregnant mothers who smoke give birth to children who are significantly lighter in weight than the children of non-smoking mothers raises the possibility that there may well be a relation (and not a beneficial one) between smoking and nutrition. It also gives us the opportunity, long sought, of presenting the world with a cure for this evil, foul, senseless, dirty, antisocial habit—epithets which we apply with sanctimonious self-righteousness, for we ourselves once worshipped, albeit unwillingly, at the feet of My Lady Nicotine.

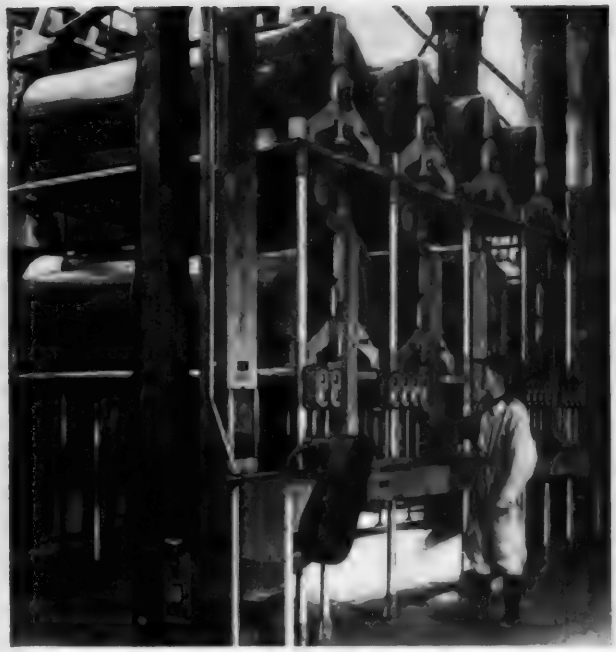
We discovered this cure accidentally while seeking a way of eliminating the Inland Revenue's share of the cost of this pernicious weed. The cure is simple—grow your own tobacco and try and smoke that.

There is nothing hard about growing tobacco; a window-box suffices but a small garden is better. The stuff grows like a weed, so rapidly and profusely that the grower rubs his hand with glee when he sees a sixpenny packet of seeds transformed in a few months into enough leaves to last him a year, with some to spare for his neighbour next door. Having gathered the leaves and dried them, the would-be non-smoker must now attempt to cure them himself, and herein lies the secret—nothing must be shirked, this nauseating process must be carried out to the bitter end, persisted in until the very thought of tobacco makes him retch. This is part of the cure.

The idea is to soak the leaves in some fermentable material (sailors use rum, but we used honey diluted with water, as recommended on the packet of seeds), press the leaves, in bundles of a dozen, in a press (we used a pile of books) and leave for three months. What happens in a tobacco factory we do not know; what happened to our tobacco was that it slowly became transformed into a mouldy rotting mass so repulsive that the thought of smoking it was immediately abhorrent.

We turned to some dried "uncured" leaves left over, stuffed those into our pipe, and applied a match; they crackled, burst into flame and were gone, leaving our tongue and throat seared by heat-flash. In desperation, to salvage what we could of our months of tender care, we mixed the remainder of our leaf with some strong French shag acquired on a Continental holiday. On smoking that, our heart began to thump and a feeling of dizziness ensued. We gave up the unequal struggle; it was much easier to stop smoking than to endure further suffering.

Strange to say, none of our colleagues has so far ventured to try this remedy, but perhaps some reader will.



(*Left*): **The pinning machines in the pea dressing plant which remove damaged peas.** (*Right*): **Gravity separators which sort and grade dried peas according to size.**

Novel Features in Batchelors' New Soup Factory

Ashford plant now in full production

FOOD MANUFACTURE recently paid another visit to this newly finished factory at Ashford, Kent, where Batchelors have introduced advanced techniques in soup manufacture and canning.

PRODUCTION at the new factory of Batchelors Foods, Ltd., at Ashford in Kent first started in 1957, when the manufacture of dried soup mixes was transferred from the firm's factory at Southall. The factory has now been completed and production is in full swing; besides the production of packet soups, canning of soup, fruit and vegetables is carried out on a large scale with machinery and equipment which must be among the most modern and up to date of its kind.

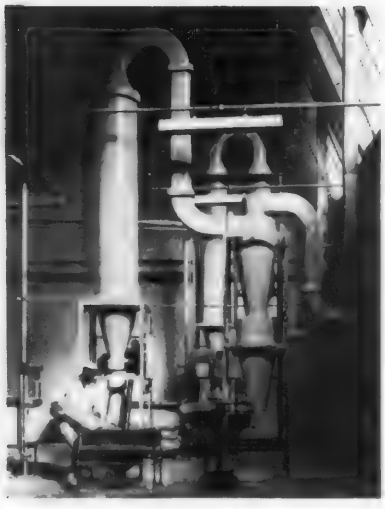
This factory has a number of novel and interesting features, among which is the fool-proof method of automatic formulation of packet soup mixes, which was fully described in FOOD MANUFACTURE, March, 1958, p. 91. The story of Batchelors is told in that previous article, and it suffices here to mention that the firm was founded by William Batchelor in 1895 and became a member of the Unilever organisation in 1943. It thus has behind it the whole of that company's vast research and marketing facilities, although it has in addition its own development department in the new factory at Ashford.

Although the newest of the Batchelor factories, it is not the largest. It employs some 600 of the total labour force of 2,800, the rest being employed at the firm's other factories at Sheffield and Worksop.

A local asset

The new factory's development has gone hand in hand with the expansion of the prosperous market town on whose outskirts it is sited. Pleasantly situated with a view over the South Downs, the factory's four main blocks occupy a 23-acre site which has its own railway siding. The four blocks comprise the administration offices and canteen, the pea and can store which also houses the elaborate plant for sorting and drying peas and cereals, the cannery with its canning lines, pressure and hydrostatic cookers and soup preparation kitchens, and the development block where are the pilot plants and development kitchen. In addition, the boiler plant forms a separate section.

Inside, pastel decorations, spotless machinery, orderly, spacious layout and much less noise than one expects from a cannery are one's immediate impressions.



Part of the drying plant for cereals and soup mixes.

Pea and can store

Empty cans are delivered in the Metal Box Co.'s lorries in metal baskets which are unloaded bodily by electric fork trucks and stacked in the can store. Several elevated conveyor lines take the cans as required to the cannery, and women load the cans a row at a time on to the conveyors by means of hand loading forks.

The previous article described much of the plant and equipment in use in the factory, and what is described here is in the way of addition and amplification. In the same building as the pea and can store is the plant for sorting dried peas. This sorting is in two stages, by physical state and by colour. The sacks of peas are emptied into hoppers, and from these they are blown pneumatically to a battery of pinning machines; these machines, of Swedish design, separate any peas having holes, *e.g.* maggoty peas, and consist of rotating drums having layers of angled pins. The peas pass over the pins and those having holes are impaled and retained. As the drums rotate the retained peas are brushed off with nylon brushes and removed.

From the pinning machines the peas pass through gravity separators which grade the peas according to size. From these they pass to the colour sorting section, where stained peas are removed in batteries of electronic sorting devices similar to those used in the Heinz factory at Kitt Green described last month.

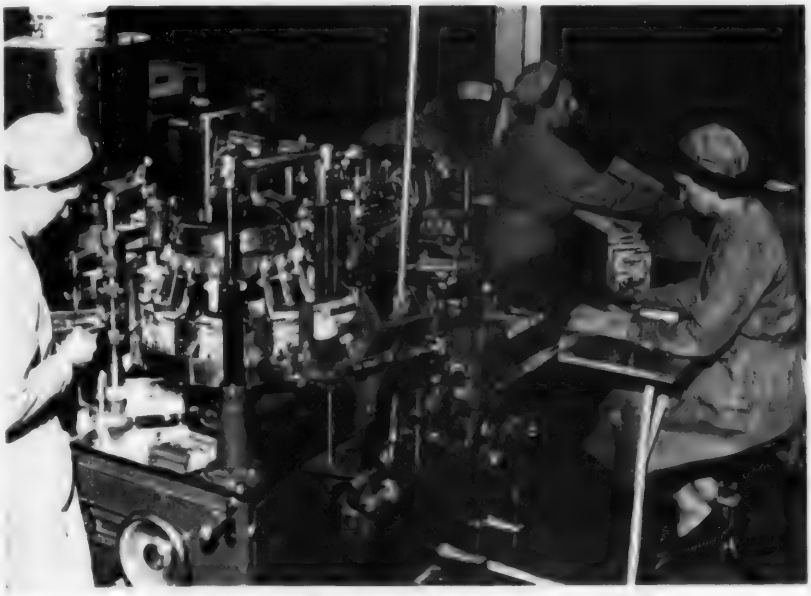
The cereal dryers, also situated in this building, have already been described; briefly, the material to be dried is passed counter-current to steam-heated air. The outlet temperature of the material is between 155 and 175°F.

The cannery

This houses the soup preparation department which is completely air conditioned. Eleven varieties of packet soup are at present made—chicken noodle, thick vegetable, oxtail, thick pea, celery, French onion, mushroom, Scotch broth, chicken vegetable, thick onion, and garden vegetable. Their formulation is done by a special control system based on the use of punched cards and a punched card reader. The main ingredients are contained in a battery of hoppers arranged in two parallel rows, and are fed from them by vibrating trays. Each hopper is controlled by an electric control system monitored by the punched cards of the coded formula, and the arrangement is such that hoppers can be drawn from only in the correct sequence. The weight of each ingredient is under the control of the operator, but as the weighing machine, which runs on a rail between the two rows of

A battery of colour sorting machines which reject stained peas electrically.

(Left): **Cans arrive in Metal Box Co.'s lorries packed in baskets which are unloaded and stacked in the can store.** *(Right):* **Cans being taken a row at a time from a basket and put on to the runway which takes them to the cannery.**



Filling and packing. (*Above*): **A filling machine which fills packets of dried soup mixes.** (*Below*): **Checking and packing soup mixes into cartons.**

hoppers, prints a card with the cumulative weight of the batch after the addition of each ingredient, and as the ingredients can only be added in a certain order, any mistake can at once be detected, as the printed weight card accompanies the batch to the floor above where it is checked by a quality control supervisor.

The canning lines have the customary filling, exhausting, sealing and clinching machines, and both retort and hydrostatic sterilisation methods are in use. The hydrostatic sterilisers are of the Mitchell-Webster type in which the steam pressure is balanced by a column of water, the height of which determines the sterilising temperature. Cans are fed on to an endless belt which takes them to the top of the structure, into a column of water in which their temperature is progressively raised. At the bottom of the column they pass into the sterilising chamber where they remain for a time, which is determined by the speed of the conveyor. From the sterilising chamber the cans pass up another column of water where they are progressively cooled until, on emerging at the top, they are further cooled by a cooling spray before passing to the packing section.

The soup kitchen

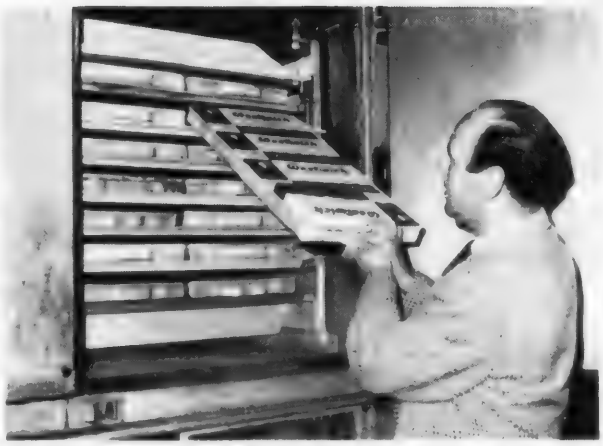
In this department the meat and poultry are prepared for incorporation in packet and canned soups. Pressure retorts cook the meat and fat is rendered. Here also is the dehydration plant in which meat is dried by cross-draughts of high-temperature steam-heated air.

The development department is a self-contained unit, having an experimental kitchen where trial mixes are prepared on a bench scale, and having a number of large pilot plants where experimental work is scaled up.

Among other noteworthy features of this new factory are: the well-equipped medical department, under the charge of a nursing sister (all new employees are given a thorough medical examination); the large machine shop; the spacious offices which have floor heating; and the comfortably furnished canteen, whose glass walls provide one of the best views seen from an industrial canteen.

SUPPLIERS OF EQUIPMENT

A.P.V. Co., Ltd.: steam-jacketed mixing pans for brines, soups, etc.
S. A. Briggs and Co., Ltd.: dryers.
Cintel Rank, Ltd.: metal detectors.
Devices (Sales), Ltd.: sorting machines.
John Fraser and Son, Ltd.: retorts.
International Machinery Corpn.: pumps, rotary cookers.
Mather and Platt, Ltd.: rotary cookers, case packers, gluers and sealers, pumps.
L. A. Mitchell and Co., Ltd.: dryers, pea graders, stirrers, hydrostatic cookers.
Metal Box Co., Ltd.: can runways, canning machinery.
Mono Pumps, Ltd.: pumps.
Purdy Machinery Co., Ltd.: labellers.
Thomas Robinson and Son, Ltd.: blowers, stone detectors.
Ransomes, Sims and Jefferies, Ltd.: fork lift trucks.
S.E.D., Ltd.: pumps.
Sigmund Pumps, Ltd.: pumps.
Tomlinsons (Rochdale), Ltd.: dryers.
Varley-FMC, Ltd.: separators.
Yale and Towne, Ltd.: work savers.



(*Left*): **A field of calabrese on the Westwick estate being examined.** (*Right*): **Mr. W. G. Muter, Director and General Manager of the factory, inspects a tray of frozen retail packs in one of the plate freezers.**

From Field to Freeze Cabinet

Quick-freezing of local produce at Westwick

Westwick Frosted Products, Ltd., a Ross Group subsidiary, have recently completed a three-year development programme for their retail packs. We have just visited their Norfolk factory, and this exclusive article describes how fruit and vegetables grown on the 2,500-acre Westwick estate are quick-frozen within an hour or two of picking.

WESTWICK, about eight miles north of Norwich, was the family home of a soldier of the Boer War, Colonel Petre, who was interested in fruit growing and who started with apples and pears. After his death, the running of the fruit farm was carried on by his wife, the Hon. Mrs. R. A. E. Petre, and his son, Mr. J. F. B. Petre. Over the years the plantations were extended, a development which went hand in hand with the rise of East Anglia as a growing region.

Shortly before the last war, Mrs. Petre and her son became associated with Mr. A. S. Alexander, the present Managing Director, who went into partnership with them, and when Mrs. Petre died, the running of the farm was continued by Mr. Petre and Mr. Alexander, who are partners to this day. After the war, Mr. Alexander started some bottling and canning on a small scale, and received fresh vigour for some ideas about further processing by a visit to the U.S.A. which he made about this time.

In 1948, through a customer, he came into contact with the Ross Group, owners of trawling and fishing interests in Grimsby (their new fish processing plant at Grimsby was described in FOOD MANUFACTURE, February, 1959, p. 51), and a merger of the two companies took place. Until his death in 1952, the Westwick company was under the chairmanship of Sir Harold Harmsworth. When the Ross Group absorbed the entire interest of Westwick Frosted Products and Westwick Preserving Co. in 1955, Mr. Alexander joined the parent board of Ross Group.

Meanwhile, quick-freezing had been added to the firm's interests, and was developed until it is now predominant, although canning is still carried out. At first, the main emphasis was on packs for catering and shipping, and retail packs were of minor importance; but in 1956 the decision was taken to develop the retail side, with the eventual marketing of all the Group's products under one brand label. This has now been accomplished, and all Westwick's consumer products carry the brand name *Ross*.

The fruit farms

These consist of five farms and supply the factory, which occupies a central position, with much of its processing requirements. An advantage of this arrangement is that produce can be processed and packed field-fresh within an hour or so of picking, a vital factor in maintaining quality. The Westwick estate covers over 2,500 acres. Over and above the acreage the Westwick farms grow for the factory, many outside farmers are contracting yearly for the growing of crops for the factory. This arrangement brings added agricultural stability to the area.

(*Left*): **Grading of apples. The spoon-shaped holders fall under the weight of the apples at predetermined points and deposit the apples in the bins, from which they are taken by the packers.** (*Right*): **Loading apples into one of the cold stores at Brockley out-station; the store will be hermetically sealed and filled with CO_2 gas.**

The farms grow a large variety of produce—apples, pears, blackcurrants, cabbages, peas, beans, Brussels sprouts, strawberries, plums, cherries, turnip greens (a vegetable popular with Americans as an alternative to spinach), calabrese (a member of the broccoli family, becoming increasingly popular for quick freezing), and many others. We toured the farm in company with Mr. W. G. Muter, Director and General Manager, whose car, as are those of other senior executives, is fitted with two-way radio, allowing continuous communication with the central office. This equipment, recently installed, has saved the company much money, we are told. The company, through its quality control department, directly supervises the growing and harvesting of produce, which is carried out under its direction. This system of quality control extends right through the entire process from growing to packing; the staff of the well-equipped laboratory make frequent tests to ensure that standards are consistently maintained.

Irrigation by effluent disposal

At one time, the effluent from the factory was discharged into the local river; when it became evident that this was far from satisfactory, efforts to solve this problem led to the idea of using the filtered effluent for irrigating the farm. This has proved outstandingly successful, and portable irrigation pipes are taken to where they are most needed in the fields and provide continuous irrigation for the growing crops. This arrangement has been a great boon during this year's very dry weather. When irrigation water is not required, the effluent is satisfactorily disposed of in the woods which form a part of the estate area.

After leaving the factory, the effluent passes through a coarse screen to remove the larger pieces of vegetation such as leaves; it is then pumped to a tank where rotating nylon brushes remove the smaller entrained solids, and then to a large settling tank from which it is drawn for disposal. The plant handles over 250,000 gal. of water a day in the season.

Such a satisfactory method of using effluent can only be carried out, of course, when, as at Westwick, factory and farm are closely situated.

The factory has its own independent water supply, which is drawn from bores on the factory estate. So abundant is the supply, even during periods of drought, that the company are able to supply water not only to the houses of employees living in the area but to a limited number of other houses.

Irrigation of a field on the Westwick estate with effluent from the factory. In this way the firm solve both problems—effluent disposal and crop irrigation.

(*Left*): **A cold store under construction; the walls are being lined with polystyrene foam blocks.** (*Right*): **The carpenters' shop where boxes and crates are made from timber grown on the estate.**

The woodyard

Mention has been made of the woods on the estate; these supply timber for making boxes and crates used by the Westwick company and sold to other users. A fully-equipped carpenters' shop is kept continuously at work cutting timber and making crates and fish boxes of various sizes, which saves the company the expense of buying these from outside. The estate works in close co-operation with the Forestry Commission, who advise on the cutting down and replanting of trees.

Out-station

An out-station, Brockley Farm, handles apples and other fruit which is either to be packed and dispatched fresh or to be kept in cold store for some time. Typical of the latter is fruit which is picked at harvest time but which is destined for the Christmas trade. The station comprises five cold stores and an apple grading plant, as well as a piggery, one of whose functions is to provide manure for the strawberry plantations nearby. Additional cold stores are under construction.

The cold stores are dual purpose in that they can be used for chilling at a temperature of 35°F. or for storing or freezing at a temperature of −10°F. Three have a capacity of over 140 tons, and the remaining two are 80 tons apiece. When used for storing fruit for extended periods, they are hermetically sealed with wax after loading, and the air inside is allowed to build up to approx. 3% CO_2 to extend the storage life of the fruit.

The insulating material used for these cold stores is Styrocell expanded polystyrene, a foam plastic which is said to be more economical and more efficient than cork because the same degree of insulation is provided by a thinner layer. Because the small air bubbles in this material are closed, it does not absorb moisture, and the blocks can be sawn and shaped easily and are readily affixed to walls with adhesive. The firm have gone over completely to this material for all heat insulation purposes.

The apple grading equipment at this station has several interesting features. The apples are unloaded on to a moving conveyor which consists of serried rows of spoon-shaped holders, each holding one apple. The holders are hinged but are prevented from tilting and dropping their fruit by a series of spring-loaded pivoted arms over which they travel in succession. The loading of the spring of each pivot can be predetermined so as to yield to an apple above a certain weight; the apples therefore fall at positions determined by their weights, and are collected in chutes beneath the conveyor which discharge them into appropriate collecting bins alongside. Each bin has a stationary spring-loaded false bottom which falls under the weight of apples so as to maintain the topmost layer of apples always at the same height, no matter how many apples are in the bin; this is a great convenience for the packers who sit alongside each bin and who take out the apples by hand, wrap them and pack them into cartons for dispatch.

Peas and beans

During the few weeks of summer when these are ready for harvesting, activity in the factory is intense and the labour force is augmented by students on vacation who are accommodated on the firm's premises. The annual influx of students is a regular feature of the firm's operations, and arrangements for their comfort and welfare are highly organised.

To deal with the pea and bean crop, ten vining machines are permanently sited in the factory; these work continuously at maximum pressure for the six weeks or so that the vegetables are in season and then remain idle for the rest of the year.

From the vining machines the peas pass to the usual winnowing, washing, blanching and cooling machines through Pyrex glass pipes to a grader, where a brine solution of adjusted specific gravity separates the peas into layers of different density which are piped off at the respective levels.

(*Left*): **Sorting beans; a snibbing machine is in the background.** (*Right*): **General view of the vegetable processing department.**

Beans go to a snibbing machine which cuts off the tops and tails, and then to a slicing machine for cutting into smaller pieces.

For canning, the prepared products are conveyed to can filling, exhausting and seaming machines and thence to retorts for sterilisation. Syrup and brine for topping up the cans is made in vats mounted above the level of the filling machines to be fed to these by gravity.

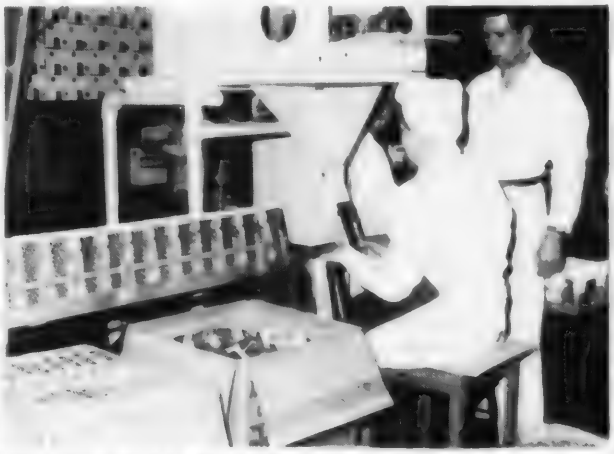
Quick freezing

Two kinds of freezing plant are used, plate freezers and air-blast tunnels. The former have the advantage that they are fairly mobile, and additional equipment can be quickly installed when demand is heavy. The tunnels of course are permanent installations.

The plate freezers consist of cabinets, each having eight freezing horizontal plates, one above the other. The produce to be quick frozen is loaded on to trays which are then placed on the freezing plates, the plates being closed by hydraulic pressure to ensure good contact. Each Jackstone Froster holds from 448 lb. to 784 lb. of produce; freezing temperature is −35°F. for a period of 2½ to 3 hr., depending on the product.

For air-blast cooling, the produce is first allowed to stand in a pre-cooling room in trays mounted on trolleys, 30 trays to each trolley (a trolley load weighs about 4 to 4½ cwt.). There are two freezing tunnels, and each tunnel takes five trolley loads at a time. Freezing time is about 2½ hr. in a blast of air at a temperature of −25 to −30°F.; the speed of the air is 40 to 50 m.p.h. Besides the two freezing tunnels their are two blast rooms of similar capacity in operation.

Produce may be frozen either before or after packing into cartons, and both methods are used. We saw in operation a new pea packing line which the company has recently installed to pack peas after freezing in the tunnels. Frozen products are kept in cold store until required for packing; from the cold store a conveyor takes cases of frozen peas to a hopper into which they are tipped by hand. The peas pass through a separating machine to break up



(*Left*): **Trolley loads of peas and beans waiting in the pre-cooling room to be put in the air blast tunnels, the doors of which are seen in the background. Each tunnel holds five trolley loads. The air duct to the tunnels is seen above, left.** (*Right*): **Cartons being filled with frozen peas by means of an automatic weighing and loading machine.**

larger lumps, then through rollers which separate any peas stuck together. They then fall by gravity into an automatic weighing machine, which discharges them in predetermined amounts through a chute, beneath which the operator holds a carton which she has taken from a conveyor alongside; this conveyor brings cartons from an automatic folding and erecting machine. She places the filled carton on another conveyor which takes it to an automatic sealing machine.

Except in the case of peas, which are weighed by automatic weighing machines, the larger packs for the catering trade and for institutions are filled by hand.

Compressor room

The refrigerating plant supplying the air-blast freezers, tunnels and cold stores includes seven ammonia compressors with a total power requirement of about 500 h.p. These are housed in a separate section of the plant. The plate freezers are not supplied, as these are self-contained units.

With its farm, its woods and woodyard, its independent water supply and irrigation system, Westwick Frosted Products, Ltd., is unusually self-contained. Its own fleet of refrigerated lorries carry its products all over the country; its export trade, too, is not inconsiderable, and a speciality of the company is supplying frozen foods to the liners of famous shipping companies. The frozen food industry in this country has a promising future, a fact which Westwick, as part of the developing Ross Frozen Foods, are taking into account in their plans for expansion.

Some suppliers of equipment

Autopack, Ltd.: weighing machines.
J. and E. Hall, Ltd.: blast freezers and blast freezing room.
Jackstone Froster, Ltd.: contact plate freezers.
James A. Jobling, Ltd.: "Pyrex" pipelines.
Lightfoot Refrigeration Co., Ltd.: contact plate freezers.
Mather and Platt, Ltd.: apple graders, pea viners, winnowers, blanchers and graders.
Metal Box Co., Ltd.: canning machinery.

New Uses for Brazil's Surplus Coffee

CLAIMED to convert expurgo coffee, a low grade of coffee that is a burden to store, into products many times more valuable than the original beans, a new process has been developed by the Stanford Research Institute, Menlo Park, California, U.S.A. which breaks down the bean into caffeine and edible oils.

In years of good crops, the coffee surplus in Brazil is held off the market by the government on the recommendation of the Brazilian Coffee Institute (B.C.I.) as a measure to prevent the depression of world prices. The reserve built up serves as a buffer for poor crop years, but the stored surplus has grown to 12·5 million 60-kg. bags (820,000 tons) by last autumn and this represented about six months' normal production. Not only was this too much to hold for lean years, but warehousing costs were mounting. Also, beans held too long in storage begin to deteriorate.

To reduce the surplus and to forestall wastage, B.C.I. withdrew the poorest ten per cent, known as expurgo grade coffee and offered it to Brazilian industry to make whatever non-beverage use of the beans it could. Except for use in soup and salad oil, however, no useful purpose could be found initially for expurgo coffee.

In December 1958, therefore, at the invitation of the B.C.I. Dr. R. M. Silverstein, senior organic chemist of the Stanford Research Institute Physical Sciences Division, and S. A. Cogwell, senior chemical technologist of the Economics Research Division, made a trip to Brazil to study the situation. B.C.I. officials hoped for some simple method of extracting caffeine, which amounts to 0·8% of the bean, the oil from the expurgo coffee, plus some commercial use for the residue. The San Paulo state government provided laboratory space for the investigations at the Instituto Agroñomico in Campinas.

The result of the investigations was a process for converting the beans into caffeine, oil and meal, which begins by flaking the green coffee beans into particles less than 2 mm. thick. Then, by using non-corrosive hot benzol, the caffeine and oil are extracted together, being subsequently separated and refined. Caffeine can be sold in world markets for use in drugs and soft drinks, while the edible oils are expected to be used inside Brazil, where there is a shortage of this material. After being steamed to remove the benzol, the remaining meal which contains about 16% protein, is expected to be suitable for animal feedingstuffs.

It is anticipated that the process developed by the S.R.I. investigators will be scaled up to commercial proportions for use in existing Brazilian extraction plants. Pilot operations started last December.

J. GRINDROD

Notes for Contributors and Authors

The Editor of FOOD MANUFACTURE welcomes articles, news items and other contributions on all aspects of food production.

The purpose of this journal is to exchange information between all those concerned in the food industry. Articles should therefore be written in a readable style, avoiding esoteric terminology and technical jargon, and should contain factual and practical information.

A preliminary synopsis should, preferably, be sent to the Editor, and the contribution itself should be typed in double spacing on one side of the paper only. It should bear the name and address of the author and should be accompanied by photographs suitable for illustrations.

The Pacific Crab Canning Industry of British Columbia–I

By Elliot B. Dewberry, M.B.E., F.R.S.H., F.R.I.P.H. & H.

The Pacific Crab, its distribution, food value, characteristics, life history and methods of fishing

THE Pacific or Dungeness edible crab (*Cancer magister, Dana*) which is the species utilised in the canning industry of British Columbia, is one of the large crustaceans found off the Pacific Coast of North America and exceeded in size only by the giant crabs of Alaska and the Baring Sea. It lives from the low tide mark to about 50 fathoms, but is not often fished in the waters around British Columbia below 20 fathoms.

The Pacific or Dungeness crab (Cancer Magister).

Distribution

The distribution of this valuable crustacean roughly corresponds to those areas characterised by firm sandy bottoms and relatively shallow waters. These include Prince Rupert harbour, Hecate Straits, Morse lake, Nass harbour and Queen Charlotte islands in northern British Columbia, Boundary bay, Burrard inlet, Sooke harbour in Southern British Columbia and also in the vicinity of Sidney, Saanich and Nanaimo in Nitinat Arm, Clayoquot and Quatsino sounds on the west coast of Vancouver Island.

Characteristics and life history

The adult crab is a cautious and cunning animal with keen senses of smell, sight and touch. The reddish-brown colour (yellowish-white underneath) of its shell blends with that of the sea bottom surroundings, sometimes making its presence difficult to detect. Unlike other crustaceans it does not inhabit permanent burrows, but will bury itself in the mud or sand. The walking legs push back and stir up the sand, the claws thrust the sand forward from the body, which settles on the animal, concealing all except the eyes and antennæ, so that it is still able to see, feel and detect food, etc. When travelling over the sea bed it moves with a characteristic sidelong gait, the nipper claws being extended or folded close under the shell. If frightened it moves backwards, presenting the powerful nipper claws, its only means of defence. It is mainly carnivorous but at times has cannibalistic habits.

The body is in two parts, the cephalothorax, the covering of which is termed the "carapace," and the abdomen. The body and limbs are encased in strong shell-like armour (chitin), consisting of three layers pierced by delicate microscopic channels and possessing all the necessary conditions of a true skin. The armour, which is hardened by the deposition of salts of lime, is thin and soft at the joints, allowing free movements of the parts. The shell protects and gives support to the internal organs and affords points of attachment for the muscles. A membranous lining covers the viscera, including the large liver, sometimes known in the trade as "the cream of crab." Attached to the body are four pairs of angular-shaped rough legs on which grow numerous stiff red hairs. In front of these are the large powerful pair of nipper claws (chelipeds), one being larger than the other and armed with rows of spines.

The crab has the power to cast voluntarily its limbs should one of these become injured or seized

during a fight, by spasmodic contraction of the muscles (autotomy), separation taking place at a constricted portion of the joint, termed the fracture plane or breaking joint. Appendages lost in this manner are replaced, the complete process ordinarily requiring several moults.

The hairs, prevalent on various parts of the body, are connected with the nervous system. The eyes are set on movable stalks and can be turned in any direction or withdrawn into the sockets.

The crustacean is furnished with short antennæ in the forehead and small antennules or feelers near the angle of each eye which are connected with the senses of taste and smell. Breathing is accomplished by means of gill chambers situated beneath the shell.

The blood is bluish in colour and is pumped by the heart through the arteries to all parts of the body and returns through a system of sinuses to the paired set of gills.

The crab can live for a considerable time out of water provided the gills are kept moist. Exposure on a hot day or to a drying wind, however, soon causes death.

Sexes

The sex of the crab can be easily distinguished. The male, or cock, has large claws in proportion to the body. The apron on the underside is narrow, hairless, and lies close to the body. The female, or hen, has a broad bee-hive shaped corrugated apron fringed with hair. The shell is more convex than that of the male, which is nearly flat. The abdomen of the hen is two-thirds as wide as it is long, while that of the cock is twice as long as it is broad.

Food requirements

The adult crab usually prefers fresh to stale food, such as small fish, shrimps, marine worms, clams, oysters and other shell-fish, which it crushes with its pincer-like claws. The food is torn in pieces, placed in the mouth openings, where it is ground up by the mandibles (jaws) and then passed to the stomach where it is further broken up by bony tooth-like structures and at the same time becomes mixed with the digestive juices. Digestion is completed by the glands in the intestines and the food afterwards absorbed.

These pictures of the undersides show the difference between the male, or cock crab (*top*) and the female, or hen (*bottom*).

The crab shares with other crustaceans the characteristics of having its skeleton on the outside of its body. The hard rigid shell (exoskeleton) does not increase in size, consequently it becomes necessary for it to shed its old shell (ecdysis) periodically and for the formation of a new one, as the animal increases in size. Crabs 3 to 4 inches in size moult about once a year, smaller ones more frequently. Very large crabs do not always moult yearly as two-year-old oysters have been found attached to their shells.

Moulting usually takes place during the months of May-September and is under the chemical control of two small glands situated at the base of the eye stalks. As the time approaches the crab becomes uneasy and seeks shelter. The shell loses its bright colour and opens up on each side at a seam-like articulation, which is plainly visible in the full-grown crab. The soft membrane between the shell and abdomen splits, and it is through this opening that the crustacean gradually extricates itself. The process is so complete that every limb is drawn out of its hard sheath, also the delicate feelers and gills, and even the cuticular lining of the stomach is cast. After moulting the crab appears as a purple-coloured mass, later changing to brick red, with the under surface white. It looks considerably larger than the old shell, which appears perfect and unbroken like a dull live crab.

The crustacean is inactive and hides itself in the sand. At this stage it is feeble and defenceless and liable to be attacked by numerous enemies, which include the conger eel, cod, dogfish, halibut, skate, rays and nurse hound sharks. The sea bream and wrasse feed on the remains of the slaughter. The crab's greatest enemy, however, before and after moulting is the octopus.

The newly-formed shell gradually hardens by the deposition of lime salts, but it is some months before it is really hard. Research has shown that the lime salts in the body are absorbed in the blood stream and deposited in a pair of sacs termed the "gastroliths," situated in the stomach walls. After moulting the reserve of lime is used for hardening the shell.

The maximum size for male crabs is about 10 inches across the back between the tips of the longest spines. Females rarely exceed 6½ inches in width, which is the minimum legal size for males in British Columbia and is probably attained during the 7th or 8th year.

Migrations and breeding habits

The migratory movements of crabs are characteristic of both sexes. It is well known in the crab fishing industry that the catch from season to season shows great variation for any given locality. This is governed, however, to a certain extent by abundance of food and changes in behaviour accompanying moulting, mating, and temperature changes, the controlling factor probably being temperature. From Decem-

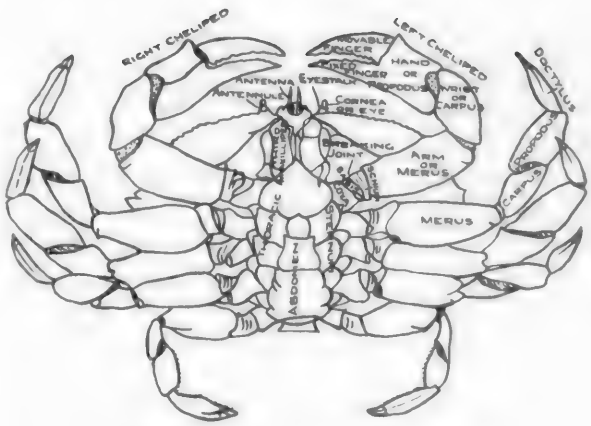


DIAGRAM OF MALE CRAB SHOWING UNDERSIDE

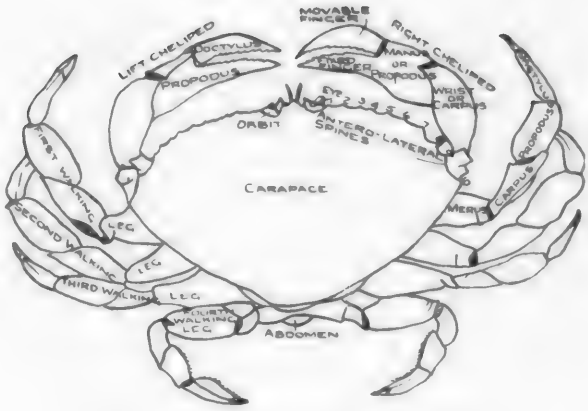


DIAGRAM OF MALE CRAB SHOWING UPPER SURFACE

EGGS & THE FIVE LARVAL STAGES.

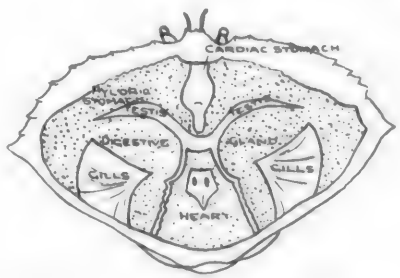
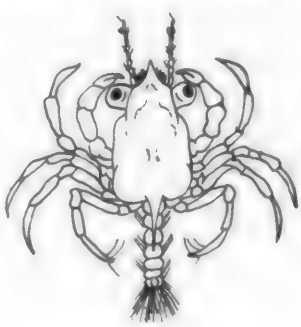
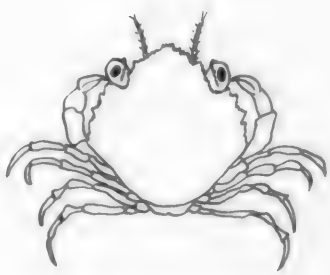


DIAGRAM OF MALE CRAB SHOWING SOME OF THE ORGANS WHEN CARAPACE IS REMOVED. IN THE FEMALE, THE LARGE OVARIES ARE LOCATED IN APPROXIMATELY THE POSITION OCCUPIED BY THE TESTES.



THE MEGALOPA STAGE



FIRST YOUNG CRAB STAGE.

ber to February they usually occupy the off-shore waters and it is there the females spawn. The movement in-shore, where the eggs hatch, begins in February and is complete by May. A crab, 1 inch across the back, passes into the beach group, when 2 inches it leaves the beach for the littoral waters beyond the low tide mark. When 4 inches it joins the mature group and takes part in the seasonal migration. Segregation on the basis of sex also takes place.

Sexual maturity occurs when the hen crab is about $3\frac{1}{2}$ to 4 inches in width, and as far as is known, only mates once. Mating of the Pacific crab occurs in British Columbia from April until September.

The cock crab is polygamous and will breed with several hens. Mating takes place as a rule on the tidal flats and occurs between a soft shelled hen (*i.e.* after moulting) and a hard shell cock. Mating crabs become almost completely buried in the mud or sand and covered by seaweed. During the period enough spermatozoa from the male are deposited in the sperm sacs of the female to fertilise all the eggs that are laid. Unlike most animals the spermatozoa remain alive for many months before fertilising the eggs. The cavity of the oviduct is closed by a secretion which hardens on contact with the sea water, thus imprisoning the spermatozoa within the spermatheca. The eggs develop within the ovaries and change colour from white to pink, salmon and reddish-orange. After fertilisation the eggs pass out of the sexual openings and become attached to the abdominal appendages.

On the underside of the apron of the hen crab are finger-like pro-

cesses termed "swimmerets" which are trimmed on each side with a delicate hair-like structure. It is to these inner branches that the eggs are attached, where they are constantly washed by the sea water and undergo development. A hen crab carries about eight bunches of eggs (the coral) and the number may be anything up to 1,500,000 eggs, according to her size, and is termed a "berried hen" or "hen in berry." She eats little, being sometimes partially buried in the sand. The egg bearing period for crabs in British Columbia is from October to June, but may extend into July and August.

(*Left*): **Live crabs being hoisted from the hold of a fishing vessel.** (*Right*): **A pile of crab traps stored on a dockside.**

Hatching of the eggs

The globular egg, which is about 0·032 mm. to 0·04 mm. in size is at first orange in colour, later changing to turkey red, when ready to hatch it turns greyish-black and the eyes of the embryo can be easily seen. Hatching, which occurs during December to June, reaching its height in March, lasts several hours and is assisted by the crab moving its abdomen backwards and forwards, the hind legs helping to detach the larva, which is termed "protozœa," a stage of short duration. It is attracted by the light, swims by active contortions (somewhat like the mosquito larva) towards the surface of the water, assisted by the antennæ and the feathered spines on the posterior part of the abdomen. The protozœa moults into the zœa stage, which has a shrimp-like appearance and is very active. It is reddish-orange in colour, with large black eyes, marked with yellow and orange. The body is hemispherical. A long beak projects from the lower part of the head and the back is prolonged upwards into a horn-like prominence and it has a segmented tail. The feet are scarcely visible, except the last two which are feathery and used for swimming. The zœa swims by rowing movements, often in a peculiar inverted position, with the head down and dorsal spine forward. During favourable years in May and June dense swarms of these larvæ

The latest type of stainless steel crab trap which has a hinged lid for easy removal of the crabs.

are seen near the shore. It feeds on microscopic plants and minute marine animals. During the period it is exposed to many dangers. Its conspicuous colour and fairly large size makes it an easy prey for a host of enemies, including the herring, pilchard, salmon, mackerel, wolf eel and also sea birds; consequently, of the enormous numbers hatched, comparatively few survive.

Larval stages

There are five zœal stages, each lasting some days, every successive larva moult showing new developments. The final stage is followed by the "megalops" which is much larger, having an average width of 3/32 inch and a length of about $\frac{1}{4}$ inch. It is of a different shape, pigmentation is more pronounced, the eyes are pedunculated, dorsal spine smaller and the tail is flat. There is a full complement of legs and claws and it still retains its swimming abilities. The megalops is a fearless voracious little animal with cannibalistic habits. It preys upon small crustaceans, devours crab's eggs and dying or dead planktonic life.

In British Columbia waters, the megalops are to be found mainly during July and August. Later, it loses its swimming abilities, moults, sinks to the sea bed and gradually assumes the first young crab stage. It burrows in the sand and mud to hide from its enemies and continues throughout its life to pass from one moult to another.

Growth

Within a year of the time that the adult form is assumed, the young crab is $1\frac{1}{2}$ inches across the widest part of the back (carapace); at the two years the coastal crabs are 4 inches in width. After the second year most of the crabs are sexually mature. There is, however, a difference in rate of growth between the males and females. In the third year the males grow to $5\frac{3}{4}$ inches, while females of the same age are an inch less in width.

Crab fishing

The boats used for crab fishing during the season April to November in the Hecate Straits (which separate Queen Charlotte Islands from the Mainland of North British Columbia) are of the West Coast purse seiner type and owned by Messrs. Nelson Bros., Fisheries, Ltd., of Port Edward, B.C. Each boat is from 50 to 60 feet long and manned by a crew of three, equipped with a boom and power girdy and carries 700 traps.

The type of trap now in use is constructed of stainless steel wire, woven as a mesh around two hoops of steel-bar, which are protected with rubber tubing. It is 42 inches in diameter and 13 inches high, has two entrances and a special hatch for the escape of crabs below the minimum legal size. A glass jar with perforated plastic lid, containing the bait, *viz.*, frozen razor clam, is suspended inside. The traps are weighted by a piece of heavy steel and set in 10 to 25 fathoms of water in lines of 50, placed about 100 feet apart.

Legislation

According to the British Columbia Fishery Regulations, all traps used in commercial fishing shall be fitted with an escape hole not less than 4 inches above the bottom frame, and at least 4 inches in diameter, if the trap is round, or 4½ inches if diagonal width of the trap is rectangular. When fishing each trap is marked by a buoy bearing the number of the licence and initials of the licensee.

Only male crabs are retained by the fishermen, the females being returned to the sea. It is illegal to take crabs measuring less than 6½ inches across (that is through) the longest diameter or greatest breadth of the shell. Very few hen crabs reach this size. The licence, which must be obtained for fishing, shall be produced on demand by a fishery officer or guardian. There are certain closed times for fishing, which vary in different areas.

Upon arrival of the fishing boat at the cannery with its catch of crabs, the sea-water is pumped out of the hold and the live crabs are placed in a large box, which is lifted on to the quayside by an electric winch. The crabs are then weighed and afterwards removed to a grading table. Any very large crabs are separated from those for canning and submitted to a special freezing process.

Food value

The following table shows the average nutritive value and chemical composition per 100 grams edible portion of raw (hard shell) and canned Pacific crab, respectively:

Hard shell	Water %	Food energy cal.	Protein g.	Fat g.	Carbo-hydrates g.	Calcium mg.	Phosphorus mg.	Iron mg.	Thiamine mg.	Ribo-flavin mg.	Niacin mg.
Raw ...	80·00	86	16·10	1·60	0·60	39	160	0·60	1·40	·06	2·70
Canned ...	77·20	104	16·90	2·90	1·30	45	182	0·90	(·05)	(·06)	(2·50)

(To be concluded)

Haslet and Haggis

THE fate of many technological books is to be read on receipt and then to continue as dust collectors on a neglected book-shelf. The revised IVth edition of *Sausage and Small Goods Production** by Frank Gerrard is not in the foregoing category. It will certainly be a well-thumbed reference book, frequently consulted by both the single shop butcher, and those responsible for the production of small goods in the bigger concerns.

The author has succeeded in conveying a wealth of knowledge in an easy to follow style, and in keeping with the increased demand for cured cooked meats and Continental and American style products has enlarged the chapters dealing with these foods. The lists of ingredients and methods of manufacture for a large number of these lesser known products, will solve many problems for those making them for the first time, and will give guidance to the maker who wishes to specialise in a particular product.

With regard to the various "improvers" of prepared goods, the author has given much space to these additives, but it requires considerable technical knowledge to appreciate their function.

In the chapter dealing with storage and preservation, apart from much good advice concerning refrigerators and their operation, there is a table of temperatures recorded in the making of 8 lb. of sausages, which shows the readings desired. This is followed by a list of suggestions concerning sausage making, which may provide the answer to problems of unsatisfactory productions.

In preparing the present edition, the author has dispensed with the section dealing with legal matters, and, in view of the frequent changes in regulations dealing with the manufacture of foodstuffs, this would seem to be a wise decision.

Changing conditions will also mean that the chapter on costings will be resorted to more frequently, as up-to-date values and examples are used.

The cooking schedule for various joints of meat will provide a timing guide, which can easily be followed, while the various recipes for items ranging from Haslet to Haggis will be generally valued.

The general utility of the publication is unquestionable, and the reputation of the author in the meat industry will be further enhanced by the excellent practical qualities of this book.—F. J. M.

* *Sausage and Small Goods Production*. By Frank Gerrard, M.B.E. Leonard Hill (Books), Ltd., London, 1959. Pp. 220. 20s. net.

Advantages of Continuous Confectionery Production

By C. Trevor Williams

The author states emphatically that continuous methods in confectionery manufacture are preferable to batch methods, and explains why, with specific reference to bulk liquid sugar systems, chocolate, high boilings, marshmallow and starch based goods.

RAPID advances in the design of continuous processing plant have changed preconceived ideas on production techniques in the confectionery industry very considerably. Such developments, which are a natural evolution, have been accelerated by intensive competition. If the mooted changes in international tariffs materialise, prices of confectionery products may fall. Confectionery manufacturers constantly survey this situation and study and test developments in plant design.

Top quality goods can be produced at the lowest possible cost only by the fastest possible methods, that is, by continuous automatic plant which will deal efficiently and economically with a large volume of material. Nothing less than the maximum application of continuous systems will suffice to maintain satisfactory profits; every break in continuity of processing means a bite out of profits; such interruptions in continuity must be rooted out to eliminate losses.

Many functions in a manufacturing unit might be either eliminated or modified to conform to overall processing continuity. The object of continuous production techniques is to ensure that flow of materials from point of entry to final packing is free from interruption.

The craftsman's place

What is the position of the confectionery craftsman in this modern development? Craftsmanship will always be needed, however much processes are mechanised. Craftsmanship is an essential adjunct to the technologist and the engineer, whose functions are to apply modern techniques to the creative ideas of the craftsman. It might be argued that the technological chemist would have the necessary knowledge of the behaviour of materials to make the collaboration of the confectionery craftsman superfluous. The subject is, however, more involved than the application of scientific understanding to the creation of acceptable types of confectionery. The craftsman has a different approach to a creative problem than the chemist, and the value of both lies in collaboration of thought. The craftsman obviously knows that the mechanics of production have changed, and he adjusts his mental approach accordingly.

Bulk liquid sugar system

A continuous flow system must start with the raw materials. Bulk delivery of ingredients is now common practice. The use of liquid sugar and glucose further simplifies material flow and streamlines production, with an important increase in hygiene, besides economising the storage space which would have to be devoted to bagged materials. The bulk liquid sugar system has eliminated losses due to spillage, filtering, and sugar adhering to the inner surfaces of discharged bags, which add up to a useful amount in a year's operation. The evolution of this form of the most important raw material used in confectionery manufacture has, in the past 25 years, proved of inestimable value to the efficiency of production units.

Continuous processing has a beneficial effect on the consistency of product quality. The chemical and physical reactions of cooking are capable of finer instrumental control with a smaller margin of error. Batch processing is prone to variations in raw materials and operating procedure; this is confirmed by routine chemical analysis of the goods produced under batch conditions even by conscientious operators. Furthermore, it is virtually impossible to achieve an identical end-point temperature in successive batches. This leaves the batch system wide open to criticism, since the limitations of essential control adversely affect product consistency.

Improved shelf life

Sugar confectionery is highly susceptible to varying climatic conditions, and the achievement of unvarying consistency in its chemical and physical properties is therefore essential to ensure that the effects of climate are reduced to a minimum. Continuous processing plant enables the confectioner to exercise a much finer degree of control than is possible in the open pan method. A constant flow to the plant of a standardised syrup mixture eliminates the likelihood of variation in raw material proportions, producing analytical consistency in the final product. The development of continuous processing has, therefore, played an important part in the improvement of the shelf-life of confectionery products.

Specific applications

Continuous processing is applied to cacao bean roasting, refined chocolate, high boilings, marshmallow, starch and gelatine-based jellies and liquorice paste. Continuous extruding plant increases

the rate of production of confectionery pastes; in fact, there are few types of confectionery to which continuous processing has not been applied. The Dunford and Elliott continuous roasting system consists essentially of a revolving cylinder in which hot gases pass over and through moving cacao beans, which pass to a cooling section of the plant. Thence they are conveyed to subsequent plant for further treatment. Interposed between the cacao nib grinding machines and the primary refiners is a Buss *Ko-Kneader* continuous system, which enables continuity of chocolate production from the mixers to the final conching plant. The Buss *Ko-Kneader* continuous plant is also applied to confectionery paste production, and is applicable to a wide range of premixing of confectionery raw materials for other types of products. The Aasted continuous system is another notable example of plant designed to maintain continuity of flow in chocolate production.

Starch-based goods

The production of starch-based jellies has been revolutionised by the development of continuous cooking systems, which speed up the rate of processing to a high degree, with attendant consistency of analytical quality and improved gels. An incidental factor of importance is the vastly diminished time the syrup is in contact with the heat source, which, of course, reduces the rate of inversion of the sucrose content to a minimum as compared with that produced in the batch method. In the case of the Farley continuous system, the liquid sucrose/liquid glucose/starch slurry is injected into a small cylinder in which the slurry is subjected to the impingement of direct steam. The starch is instantly and fully gelatinised, the paste being progressively injected into mixing vessels, where colour and flavour are added, providing a continuous flow of material by gravity to the depositing plant. The system, once the controls have been pre-set, is completely automatic, and produces starch-based jellies of consistent stability, eliminating the operational variations incident to the batch method.

Another highly successful continuous cooking system applied to starch-based goods production is the *Votator* heat transfer plant, in which the slurry mixture mentioned above passes through an anular space, where it is in contact with the heat source for a matter of seconds. The mass is kept in positive motion through the anular space by means of scraper blades; thence it passes through a cooling cylinder and is ejected into mixing vessels for subsequent treatment.

Both of these excellent continuous cooking systems have reduced the processing time to an absolute minimum, which is very favourably reflected in production costs. As operational knowledge of the possibilities of these continuous cooking systems develops, pre-conceived ideas relating to confectionery processing have to be adjusted. The extremely short time of contact with the heat source by the mass renders it possible to consider application to other colloidal raw materials in types of jelly confectionery. An interesting effect of continuous cooking is demonstrated by its employment in the production of liquorice paste. The effective cooking time is reduced from approximately three hours to a matter of seconds, the gelatinisation of the constituent starches, moisture evaporation and mechanical agitation being satisfactorily achieved in this small space of time.

Continuous boiling

The effect of continuous vacuum cooking and continuous atmospheric cookers of the micro-film type on the production of high boiled confectionery is self-evident. These systems have been developed to an extremely high degree, and the ancillary equipment for the subsequent formative and wrapping processes has developed with equal rapidity to enable the complete overall manufacturing process to keep pace with the high output of such continuous cooking plant. Here, again, a much higher degree of analytical stability is achieved, which, as has already been mentioned, is reflected in the storage life of the final products. In the case of high boiled confectionery, differing opinions exist on the comparative organoleptic quality and texture of the confectionery produced by means of modern continuous cookers as compared with that cooked by the open pan method. It must be accepted that consumer taste adjusts itself over a period so imperceptibly that the transition from one texture to another is unnoticed.

Continuous processing has been applied to the production of fondant base for many years. Gelatine-based marshmallow is produced in a continuous flow by means of an ingeniously modified ice cream processing machine. Pipe lines directly feed the hoppers of the depositing machines, which cast the mallow into imprinted starch, or, alternatively, the mallow is piped into cartons for shipment to manufacturing flour confectioners. Thin film heat transfer systems of differing types have been evolved for the continuous processing of confectionery amenable to this method of cooking.

The objective of confectionery technologists, in collaboration with mechanical draughtsmen, is the elimination of superfluous and costly handling of material in its progress through the producing unit. Additionally, control of processes by means of automatic devices is a progressive step toward stability of product, and the many appropriate forms of automatic control instruments have become an integral part of the continuous processing plant. The hazard of possible variation is eliminated.

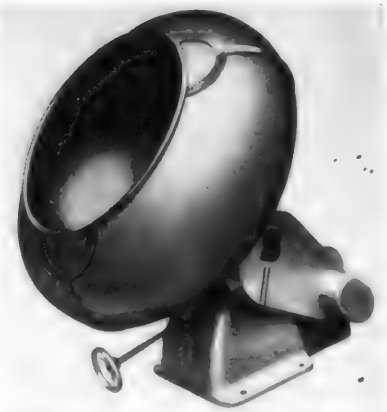
Whether the mechanisation of confectionery processing will progress still further to complete automation is a problem for future technologists.

There is no doubt whatsoever that continuous processing systems have exerted a profound and beneficial influence on the confectionery industry in common with other food products.

CONFECTIONERY

Plant and Machinery

In this FOOD MANUFACTURE survey confectionery makers may find just the item they are seeking.



The latest addition to the range of coating pans made by C. Skerman and Sons, Ltd., has a 5 ft. bowl and a capacity of up to 5 cwt.

CHOCOLATE CONFECTIONERY

Coating machinery

WALTER Denis Contacts Co., Ltd., make equipment for the chocolate coating of sweet centres and biscuits. They also specialise in the type of equipment which is complementary to an enrobing plant.

Walden enrobers are mainly divided into two types, the *Zenith* for sweet centres, and the *Supreme* for biscuits, etc. Both types are fitted with a patent temperature control system claimed to give control to a fine degree. Alterations to temperature settings are effected easily and quickly by means of control knobs on the control panel in the stainless steel enrobing hood. The enrober chocolate tank is divided, each section having its own water jacket, said to give extra efficiency in the maintaining of correct temper. Chocolate passes from the main tank through the Walden sliding vane pump, and into the flow pan, which is fitted with two patent rotary valves providing twin chocolate curtains. Chocolate for the bottom surge device passes through a water jacketed surge tray, and the surge itself is extremely efficient. The fact that the bottom surge is placed after the twin chocolate curtains is claimed to be of particular advantage when enrobing light centres. In the case of the *Supreme* enrober, either a motorised adjustable tailing roller or a half coating biscuit turnover roller can be fitted. Drives to the above pump and stainless steel wire conveyor band are through independent clutches, whilst the main drive motor itself is fitted with a safety slip clutch.

Pre-bottomers and half coaters are supplied with all the features of the enrober that apply to pre-bottoming and half coating.

An apparatus that can be fitted to the enrobers is the Walden trickle feed unit which enables an initial bed of tempered chocolate to be obtained in the enrober, and then provides a continuous replacement of conditioned chocolate at the rate of usage.

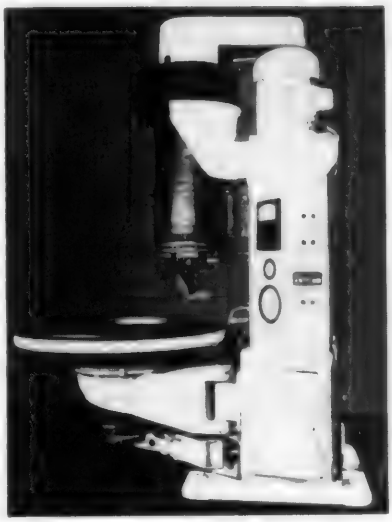
The firm also make chocolate kettles, ranging in size from 200 lb. to 1,000 lb. capacity, fitted with the patent temperature control. Bulk storage tanks are built in sizes of 5, 10, 12 and 15 tons, or can be designed to suit particular requirements. The storage tanks are fitted with steam and electric heating arrangements, selection being by means of single selector switch.

In both cases temperature is controlled by one instrument, and an overheat safety thermostat is fitted. To complete bulk storage systems, water or oil jacketed pipe lines can be supplied with either small or large capacity pump units.

Walden forced air circulated refrigerated cooling tunnels are now designed with completely removable side panels giving complete access for maintenance and cleaning to all levels of the tunnel. The standard chocolate tunnel can be fitted with plastic or paper band, these being carried on a slat conveyor with return creeper chain.

For some applications, such as wafer biscuit cooling, the slat conveyor only is used. Air circulation through the tunnel can be straight through from exit to entry, centre applied with flow in both directions, or staged with two or more refrigeration points.

Some of the Walden installations in the York factory of Joseph Terry and Sons, Ltd.



The large Microfilm continuous sugar cooker made by Baker Perkins, Ltd., can produce more than 1,000 lb. per hr., according to the formula being cooked.

Conches

Emmerich (London), Ltd., are the British suppliers of Petzholdt conches of which there are three models, "whirling," "dry," and "super."

In the whirling conche the process is divided into preliminary conching and refining. In the course of the conching the dry chocolate is turned into a pulpy mass by heat. During the preconching, which lasts 4-6 hr., water-soluble acid and other unpleasant tasting substances are evaporated and the particles are thoroughly mixed. Cocoa butter or lecithin is then added and the mass is refined with the rotor running at high speed in reverse. The mass is drawn into the rotor, shovelled up on to the inner wall and flung off in the form of a veil-like mass on to the inner wall of the vessel.

The surface division of the mass into thin veils takes place during the constant rotation, which takes about 1½ min.

Fresh air is sucked in through the hollow drilled shaft and this helps to develop the aroma of the chocolate.

The dry conche is designed for the processing of chocolate of low butter content, while the super conche is said to combine the advantages of both machines.

SUGAR CONFECTIONERY

Sugar boilers

Baker Perkins say that their new large *Microfim* cooker is capable of producing automatically and continuously a wide range of boiled sugars. Because no vacuum or pressure is needed for cooking, continuous operation is said to be possible since all that is needed is a steady supply of dissolved sugar. Consequently, the cooker may be used in a continuous candy production line or for other continuous processing such as sugar coating of cereal.

According to Baker Perkins engineers, the design of the cooking cylinder, the use of the centrifugal principle for spreading a very thin layer of sugar on the cooking surface, permits rapid heat transfer and a very fast cook. The thin film of syrup on the cooking surface is continually scraped off and mixed. This feature, along with the rapid cook, is said to permit use of the cooker for a wide variety of syrup formulas and special ingredients.

Cooling of the cooked syrup is also rapid. The machine has a water-cooled, conical cooling table which revolves at any one of five adjustable speeds. This quick cooling helps to protect the clarity of the sugar, and prevents progressive inversion in the hot syrup.

The capacity of the new *Microfilm* varies, of course, with the formula being cooked, but the average output is 1,000 lb./hr. or better. Because of the high efficiency of heat transfer, it is claimed to have an exceptionally low consumption of steam in relation to its capacity.

All controls of the cooker have been located within easy reach of the operator, dials and gauges are positioned for each reading and provision is made for complete washing out after a day's run.

The machine is clean in appearance and use, allowing no steam to enter the room or boiled sugar to fall on the floor.

Heat exchange cookers

A. Johnson and Co. (London), Ltd., say that their *Votator* scraped

A machine for the continuous cooling and aeration of marshmallow, supplied by A. Johnson and Co. (London), Ltd.

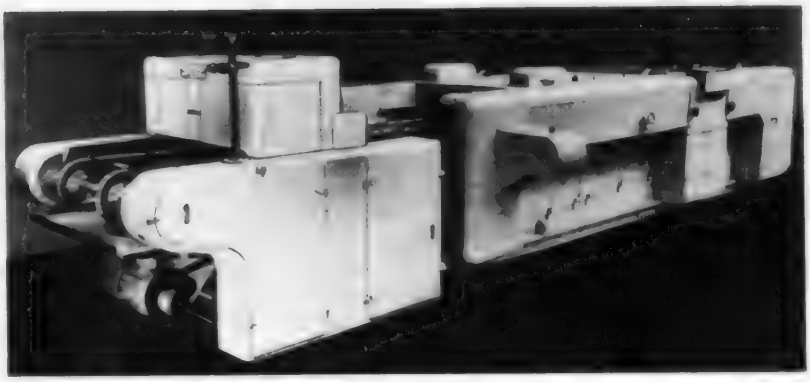
surface heat exchange equipment has many applications in the confectionery industry. For processes involving starch, agar-agar, gelatine or pectin based goods the system offers continuous processing without, it is stated, the wastage of fuel, power and labour incurred in boiling off excess moisture when working with batch pans, since one can cook with premixes containing only the required moisture content of the finished article.

The rapid cooking time and scraping effect of the blades on the mutator shaft are claimed to exclude any possibility of local overheating which would cause material degradation.

High solids content solutions of mixed sugars are easily prepared and here again the solution obtained will be much lighter in colour, it is claimed, than the corresponding product prepared in an open boiling pan.

Continuous cooling and aerating of various types of marshmallow may also be carried out with this equipment. It is stated that gelatine and egg albumen based marshmallows with densities down to 0·18 are readily produced.

Liquorice paste may be produced on a continuous basis and a wide variety of recipes containing varying amounts and qualities of flour can also be processed. Nougats are also suitable applications in particular where the first stage involves making a solution of mixed sugars into which is fed a solution of egg albumen. Converting this process to *Votator* equipment involves using a 3-cylinder machine in which the first cylinder would be steam heated to complete the solubilisation of the sugars, the second tube would cool the material sufficiently to allow the addition of egg albumen, whilst the third cylinder would complete the mixing of the egg albumen solution, also cooling and aerating the material at the same time. A further application in the confectionery field for this equipment is said to be the continuous cooling and aeration of biscuit creams.



The completely redesigned Master starch moulding machine made by Baker Perkins for which the makers claim greater ease of operation and maintenance.

Lollipop machines

W. J. Hart and Sons (London), Ltd., are the United Kingdom and Commonwealth representatives for some new equipment for the manufacture and wrapping of lollipops. This equipment consists of three distinct units.

The first is a production machine which can make a variety of different shape lollipops. In particular this machine will make ball lollipops and by pressure insert safety sticks into them. This machine produces lollipops at a speed of 120 per min. and can deal with ball lollies of a minimum diameter of 25/32 in. and a maximum diameter of 1 9/16 in. The stick is 1/16 in. in diameter and 3 15/16 in. long. In addition to ball-shaped lollipops, other shapes can be made on this machine, and on flat lollipops it is also possible for engravings to be made.

The same manufacturer also produces a rotary cooler and a wrapping machine for lollipops. This latter will wrap the lollipop in film, foil or waxed paper, at a speed of approximately 45 per min. The wrapping machine can deal with paper from $3\frac{1}{8}$ in. to $5\frac{1}{2}$ in. long and up to $5\frac{1}{8}$ in. wide.

STARCH MACHINES

Starch moulding machine

Baker Perkins, Ltd., have released a completely redesigned starch moulding machine called the *Master*. The machine has been tested under production conditions for several months. The new machine is fully streamlined in construction, and the makers claim greater ease of operation and maintenance, higher speed of depositing, and other benefits.

It has been designed to handle the usual range of tray sizes. The trays are carried on moving tracks, claimed to eliminate wear on the tray bottoms. Raised pushers on the track ensure exact positioning of the trays throughout the cycle.

During the dumping operation, the trays are clamped into the tipper and are then released in proper position for subsequent processes, without danger of jamming and damage to trays and equipment. The trays are tipped away from the feed end, and all the starch is carried forward by means of a scraper conveyor which covers the entire width of the machine.

The starch elevator and leveller operate so that all of the elevated starch falls into the trays. The flow of the starch can be guided to give uniform distribution of the starch in each tray, and the leveller packs the starch evenly. A cam-operated printing stroke is employed, providing sharp impressions in the starch. Printing boards are replaceable and the printer height can be adjusted from either side of the machine. Baker Perkins say that the cross wipers are fully supported, cutting down on vibration and assuring better tray cleaning.

The dumping screen, brush sections, tailings screen and swinging air-brush are all readily inspected

and removable from the side of the machine. The main sieve assembly is horizontally balanced, and can be withdrawn from the side of the machine, leaving the entire inside of the machine accessible for cleaning. A sliding panel in the base of the sieve, under the tray tipping section, permits bypassing of starch to a starch conditioning plant.

The sieve uses brushes which present a continuous bristle surface for carrying the goods. The top cover of the sieve is fastened independently of the sieve itself, and is hinged so that the brushes can be inspected without removing them from the sieve frame.

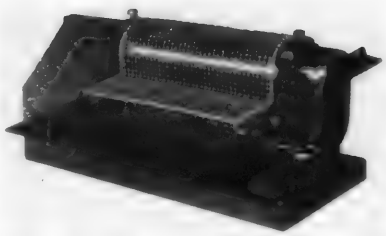
As the goods leave the main sieve, they are discharged into a built-in stainless steel elevator. This delivers the articles at table height on to trays or a conveyor adjacent to the starch plant.

Adjustment of deposit centring can be made while the machine is in operation. The depositor settings are provided with setting scales, and the synchronisation of the depositor with the starch buck and the rest of the machine may be accomplished easily and accurately. The position of the depositor hopper is also adjustable for the varying number of deposits per tray.

The depositor can accommodate a wide range of pump bars, and two or more depositors can be supplied if required. The pump bars may be standard, single or multiple row models, or the special *Savy* DOVO type for simultaneous side-by-side or centre-within-shell depositing of two ingredients.

Every effort is stated to have been made in redesigning the machine to provide ease of cleaning and maintenance. The machine is of all-metal construction and is fully enclosed, with hinged or loose covers fitted where necessary. No motors or drives are external to the machine. Ball or roller bearings are used throughout, and are sealed and self-aligning wherever possible, thus reducing lubrication to a minimum.

With the main sieve removed, the whole machine inside is accessible for cleaning. Air circulation



The B.C.H. Turkish Delight cutting machine handles up to 18 cwt. per day.

is internal, and by means of a collector fan, starch dust is prevented from escaping into the room. The entire machine is mounted on a ¼ in. thick continuous base plate which is levelled at 4 in. off the floor.

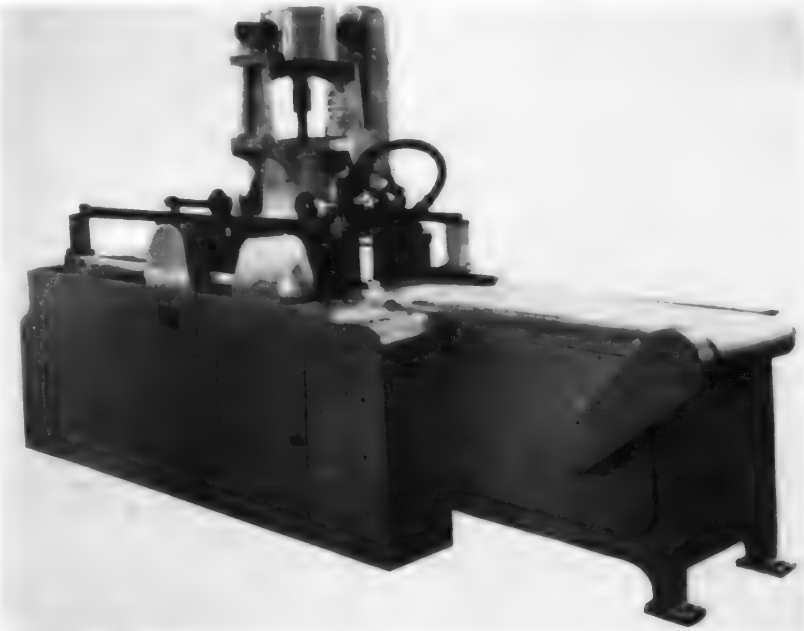
Starch conditioning plant

The L. A. Mitchell Organisation, in co-operation with Huhn of U.S.A., now offer a complete range of starch cleaning and conditioning plants specially designed to maintain moulding starches in the correct condition for the production of particular lines, *e.g.*, gums, jellies, creams, marshmallow, etc.

The most popular sizes of unit used for the drying of moulding starches are the DC5 and DC7 machines which between them are said to cover a wide range of outputs, the actual quantities handled being dependent on the moisture range and the required terminal moisture content of the starch. Each plant is designed especially to meet the customer's duty, but a typical performance, however, for a DC7 machine working on moulding starches would be, say, 15,000 lb. per hr. output when heating starch to 165/170°F., with subsequent cooling to 100°F. and drying from 8 to 6% moisture content.

The use of a continuous machine operating on a cyclic basis in conjunction with the depositing machine is said to allow the manufacturer to take advantage of the higher tray speeds available in the newer depositing machines. In addition there is a considerable saving in space, particularly where the plant is mounted outside the main building in a penthouse on the roof for instance, a system which Mitchells say has been widely adopted in U.S.A. and Canada and gives an extremely compact arrangement.

The complete drying and conditioning plant covers sifting, drying and cooling sections, with the starch being cleaned and sifted



The Brierley, Collier and Hartley liquorice extruding machine can be used on cream paste and liquorice cigarettes as well as liquorice sheets, tubes and twisted designs.

free from tailings. After this it passes through the dryer where the temperature is raised to the correct figure for drying and the required quantity of air passed through the cascaded starch in order to entrain the moisture given up. The correct drying temperature can be maintained by automatic control. After drying the starch is carried on to the cooler where the starch temperature is reduced to the desired point by the circulation of either chilled air or water through the cooler. Before returning the treated starch to the moulding machine, all the material passes through a magnetic separator designed to remove ferrous metal particles, etc., which may have entered the starch. Any starch carry-over that may occur in the dryer is taken care of in a bag filter system equipped with automatic cleaning devices, this filtered starch being returned to the main system.

Protection is given to the plant by the inclusion of explosion and fire suppression devices. This method of automatic continuous conditioning of the starch compared with the older methods is claimed to provide a far higher degree of uniformity and saving on space and labour costs as well as giving a material which will make better moulds due to the aeration received during its passage through the system.

MISCELLANEOUS MACHINES

Liquorice machinery

A large number of confectionery machines are made by Wm. Brierley, Collier and Hartley, Ltd. Among these is a liquorice extruding machine with new improvements, and, the makers claim, the highest output. The machine, which is adjustable for a variety of designs, is offered in two widths, 16 in. and 13 in., and B.C.H. say that it gives uniform, accurate extrusion of liquorice sheets, tubes and twisted designs.

Other machines made by this firm include a crystallising and sanding machine, 32 in. wide for gums, pastilles, etc., which can be supplied with supplementary steaming unit and continuous dryer, a new layering machine for the layering of cream paste on liquorice sheets which simultaneously prints the name on to the cream paste, a balling machine for chocolate truffles, chewing gum balls, etc., and a nougat cutting machine which has a motor drive and a roller table. B.C.H. also claim to make the only machine which cuts Turkish Delight successfully and has an output of 18 cwt. per day.

Cutters and mixers

Many types of cutting and mixing machines are available to the confectionery industry. Two machines are offered by Foodtech, Ltd., the KS high speed cutter and the EMS cut-mixer. The former converts fibrous materials into a finely chopped mass in a short space of time, and this is accomplished by two high speed knives cutting in conjunction with a perforated plate, the size of the perforation ranging from the coarse at 18 mm. down to the superfine at 0·8 mm. Foodtech say that the machine is particularly suitable for the chopping of fibrous fruits, nuts, etc., to give a smooth and fine paste. It can be supplied with a stainless steel interior, knives and plates if required. The latter machine is claimed to be the most advanced form of cutter mixer at present available. This machine incorporates an extra large dome to avoid heat build-up during chopping, and with the optional automatic ejector enables the rapid processing all materials. This machine with its reserve of power is able to process deep frozen raw material by means of its specially designed stainless steel knives, which can be fitted in sets of 3 or 6 as desired. The machine, in addition to chopping ingredients, mixes them together, thus performing two functions simultaneously. It deals with fruits, nuts, etc., in quantities from 20 lb. up to 4 cwt.

Bowl mixer

A new range of variable speed bowl mixers, Bear *Varimixers*, has been introduced into this country by Sorensen Bakery Equipment, Ltd., who say that the machines with a wide speed ratio of 1:6 fulfil a need in the confectionery field.

The machine is of streamlined design and is operated by the movement of a lever backwards and forwards, controlling the speed. The machine has a planetary action and the tools turn around themselves, making a circular movement. A singe movement of a lever both raises and clamps the bowl into position. Drive is by V-rope and the shafts and planetary head have dustproof ball-bearings which do not need lubrication.

The mixers are available in three sizes, 42, 63 and 95 qt. capacity, each with a beater, whisk and dough hook. A smaller size bowl is also available for each model.

Coating pans

Charles Skerman and Sons, Ltd., have been manufacturing coating or dragee pans for over 40 years, and the latest addition to their range is the new 5 ft. diameter pan, which has a capacity of up to 5 cwt.

While the shape of the pans has not changed greatly over the years, the methods of production and the type of drives have altered considerably. Until quite recently the drive had been transmitted through open crown wheels and pinions. Now the drive is claimed to be silent and smooth and maintenance has been practically eliminated, all working parts being totally enclosed and running continually in oil. The new machine is fitted with infinitely variable speed control, mounted easy to hand on the front of the machine, a feature which can also be incorporated in other pans of their range.

Pans can either be made in copper or stainless steel and with a very wide variety of shapes to suit any particular requirement. They range from the small 12 in. diameter pan to the new 5 ft. diameter model. Hot air units can be supplied with the pans, if required. Apart from coating pans, Skermans also manufacture a

range of stainless steel or copper pressure and storage vessels.

Another side of their business is the marketing of rebuilt second-hand processing and packaging plant for the confectionery and food industries.

Dragee pan

The new *Centrus* dragee pan with automatic discharge is being sold in the United Kingdom by W. J. Hart and Sons (London), Ltd. It is claimed that continuous processing now becomes possible with this pan, as automatic discharge operates by tilting by means of a special brake-motor. When the pan is stopped in its vertical discharge position there is a clearance of 24 in. between the pan opening and the floor, permitting receptacles to be moved freely under the tilting pan. By this automatic discharge the pan can be cleared within 8-10 seconds, and according to the suppliers there is no possibility of damage to the finished product which previously happened when the pans were hand-emptied.

These pans are made from copper plate and are seamless and polished. The bottom of each pan is made of reinforced material. The standard copper pan *Centrus-Automatic* can also be supplied in V2A stainless steel, if required.

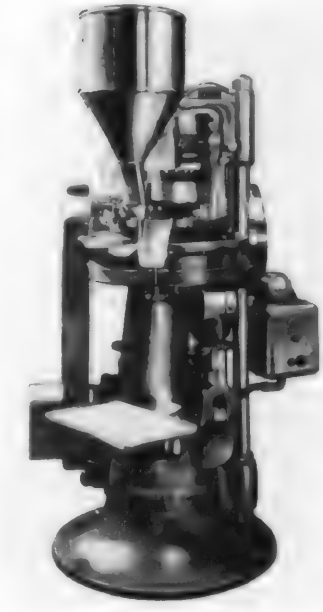
These pans are available in different sizes from 120 cm. diameter to 70 cm. diameter and also of a depth from 35-55 cm.

A small model, the *Labor-Centrus*, which takes up to 22 lb. batches, is also available.

Tabletting machines

Manesty Machines, Ltd., have been supplying their tablet presses to the confectionery trade for nearly 50 years and a considerable number of well-known lines of compressed confectionery are made on their rotary and single stroke machines.

Manesty say that compressed confectionery has the advantage that the product is perfectly regular and even in shape and allows for attractive roll wrappings and other forms of presentation. One machine in constant use is the



Manesty machines. (*Top*): **The D34 rotary tablet machine which has an output of up to 30,000 tablets per hour.** (*Bottom*): **The CP2 coating pan.**

D3A rotary tablet machine which has an output of 30,000 tablets per hr. A new model which has been introduced this year is the *Rotapress*. The confectionery model has 37 pairs of punches, gives a maximum pressure of 10 tons on a maximum tablet diameter of 1 in., and can produce over 3,000 tablets per min.

Other machines in the range made by the firm include mixers, granulators, drying ovens, and a range of coating pans. These coating pans can be supplied with constant or variable speed drive, and pans in various metals, including stainless steel. If desired, each pan can be fitted with a self-contained hot air blower.

Bulk mixers

Among the large range of processing machines manufactured by Wm. Gardner and Sons, Ltd., are some which have been used for many years in the confectionery industry.

The horizontal mixer is a popular machine for the bulk mixing of all types of dry materials. It is also supplied with a super-imposed sifter for pre-sifting material before mixing, and with spray equipment for adding essences, etc.

These machines have been designed for easy cleaning and sizes range from 15 lb. to 5 tons capacity.

For pastes, dough, creams, etc., there is the double arm mixer, which is a powerful machine, having two special shaped arms separately driven, and revolving in opposite directions.

Where dry mixing is required without breaking down the ingredients, the double cone mixer has become increasingly popular. In this machine, which is fitted with a patent internal deflector plate, perfect mixing is claimed to be achieved by means of a rolling and folding action.

Gardners also supply a disintegrator which is used in sugar grinding, and various types of granulators for reducing dry, moist or sticky lumps to granules, *e.g.* breadcrumbs, malted foods, starches.

In addition to standard machines, Gardners also design and manufacture complete plant and equipment connected with the various processing operations.

A range of different mixing machinery for the confectionery industry is made by the Morton Machinery Co., Ltd. Their vertical mixers range in size from 20 to 120 qt. bowl capacity. The mixing paddle has a planetary as well as rotary action, and this, in combination with the Morton bowl

scraper, ensures excellent mixing without stops for bowl scraping. One of the improvements incorporated in the new models is a brake actuated in the stop position designed to prevent "beater creep" when the machine is stopped.

The Morton marshmallow mixer is specially constructed for the manufacture of the stiffer varieties of marshmallow and is designed to run at slow speeds. The mixing blades are contra-rotating. Provision is made on this machine for the addition of ingredients without opening the lid.

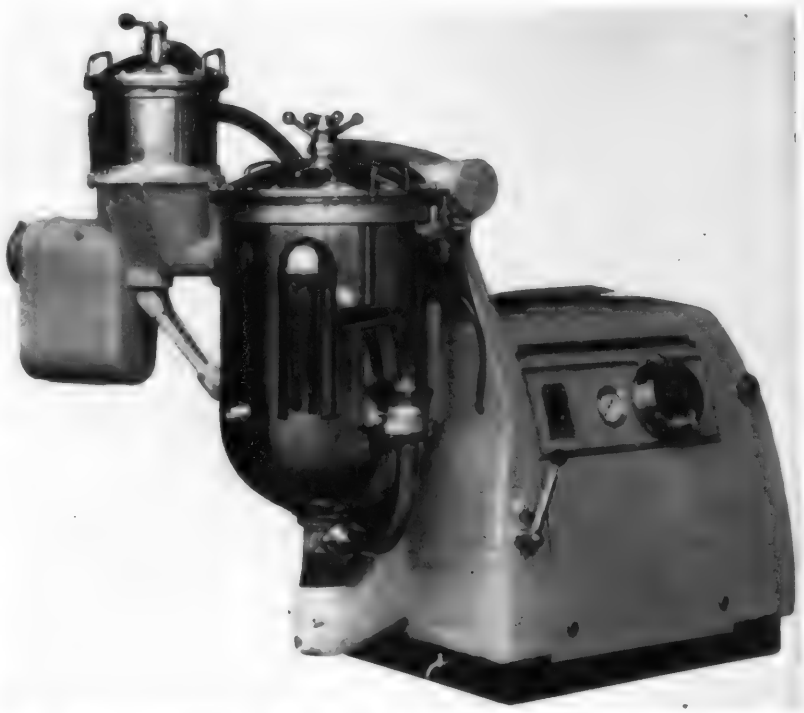
Air pressure whisk

Mortons say that when materials such as mallow, which require a high degree of aeration, are whisked under an air pressure of from 10 to 22 p.s.i. (instead of atmospheric pressure), they benefit from increased volume to as much as 10%. The Morton air pressure whisk has been designed to carry this principle to the manufacturer. The machine is completely automatic in operation, being controlled by a timing device to give the exact whisking time required for any product. Syrup or dry powder feeders can be fitted, thus enabling materials to be added to the mix without removal of the lid or stoppage of the machine. Tilting discharge models can be supplied or a pneumatic discharge fitted, such that the material can be transported considerable distances by air pressure.

The Morton Machine Co., Ltd., also supply caramel brakes, the rolls of which may either have a *Fluon* coating or have parallel longitudinal serrations for ease of handling of the caramel, marzipan, etc. The rolls are adjustable and an indicator gives the exact thickness of the material passing through.

Centrifuges

A horizontal desludger is one of a range of centrifuges made by the Alfa-Laval Co., Ltd. This machine is intended for fractionating the cocoa mass after cocoa beans have been ground and milled, the bulk of the cocoa butter and fines going forward for further processing while the coarse fraction is returned for further milling. Capacity is up to 1½ tons per hour.



The Morton air pressure whisk works at a pressure of 10-22 p.s.i. and is completely automatic in operation.

Material feeder

A new hopper-type of material-feeder, of 2 cu. ft. capacity, is now being manufactured in this country by Pulversing Machinery, Ltd. Called the *Mikro-Feeder*, it has been designed to give an accurate, constant, and uniform flow feeding of any wet or dry substances, other than those which are viscous or semi-viscous.

The feeder can be used as a feed-unit for a ball mill or pulveriser, for a dryer or mixer, and for any purpose which requires a continuous feed.

The machine consists of a vertical rotating-shaft on which is mounted a circular feed-plate and a 15 in. diameter steel hopper, 21 in. high. Both plate and hopper rotate as one complete assembly.

The rotating-shaft, feed-plate, and hopper are mounted on a steel housing over the drive motor and reducer-gear. Secured to this housing is a shearing-knife, which slides between the base of the hopper and feed-plate. When the feed is in action, the hopper filled with material, revolves, and the shearing-knife at its base shears off just enough of the substance to maintain a chosen feed-rate. The rate of feed may be varied from a few pounds to 500 lb. per hr., according to the material being fed.

Dryer

George Scott and Son (London), Ltd., supply a continuous vacuum band dryer which is used in the manufacture of chocolate crumb for milk chocolate. In this process sweetened condensed milk is concentrated under a high vacuum to a high density and thereafter mixed with the required amount of cocoa liquor to give a pasty material containing approximately 88% solids, which is then dried under a vacuum of 29·2 to 29·5 in.

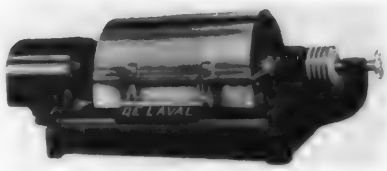
The Scott continuous vacuum band dryer has been used for this drying operation. The machine comprises a chamber housing a number of closely woven wire

conveyor bands, each of which encircles a number of steam or hot water heated cavity plates so that the conveyor band just rests on the upper surface of the hotplates. The viscous feed liquor is pumped by means of a positive pump through a special feed device which gives an even spread across the width of each conveyor. In its passage down the machine the material gradually dries and it is possible to vary the degree of heating along the length of the machine. The dried product leaves the conveyors at the discharge end of the machine and is roughly broken before passing into the receiving hoppers, where it is periodically unloaded from the vacuum system. Means are provided to vary the time of travel of the material along the length of the machine.

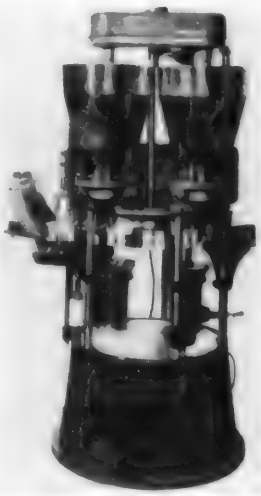
Wrapping machinery

SOAG Machinery Co. have introduced to this country a range of wrapping machines from Italy, the ACMA range, which are said to be economical in floor space.

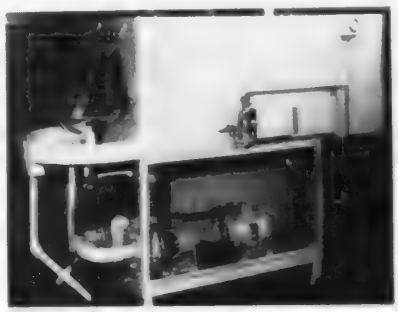
The range includes the model 733/1 bag opening, filling and closing machines, using pre-made bags from the stack. The machine opens the bag which is introduced to grippers on a horizontally revolving turret where folding is carried out by volumetric dosing or by auger feed. After filling, the bags can be closed by either heat or glue; a dust suction device is available. The output of the machine is up to 65 per min. A double version of this machine, the 733/3, is available for a fixed bag size, and this unit is capable of filling up to 130 bags per min. The range also includes portion packaging machines, the bag or sachet being formed from a single reel, filled and closed in one fully automatic working passage. There are two models of this machine capable of speeds of 65 and 130 per min. respectively. The latest high speed wrapping machine, type 760, can be supplied to provide twist wrap at both ends, bag or biscuit wrap with twist one end or folding to points. The machine is provided with automatic feed for oval, spherical and rectangular products. Electric eye registration for preprinted material from the reel is available on this as most other ACMA machines. The 760 is capable of speeds of between 300 and 350 pieces per min., but other models in the range are available for higher outputs ranging from 9,000 to 12,000 per hr. One of the other machines available is the 750, a machine specially developed for the twist wrapping of small tablets or sweets, and production speeds of up to 30,000 per hr. are obtainable.



The De Laval desludger used for the fractionation of cocoa mass after grinding and milling cocoa beans.



The ACMA 733/3 bag opening, filling and closing machine supplied by SOAG Machinery Co. has a capacity of up to 130 bags per min.



This rotary confectionery jar washer and dryer made by Dawson Bros., Ltd., washes, delabels, sterilises and dries up to 60 jars per min.

Washing and sterilising machines

Various machines for washing and sterilising equipment, machinery, etc., are made by Dawson Bros., Ltd. These include a tray and utensil washing and sterilising machine. These machines are made in a wide variety of sizes to handle from 60 to 1,000 items per hr. with a wide variety of treatments to suit the conditions and types of trays or utensils to be cleaned. Both wooden and metal trays and utensils can be handled. Individual requirements are given individual attention, thus ensuring that the machine supplied is the best possible for the work to be done.

Machines which wash, de-label, rinse and dry biscuit tins and lids are made in different sizes to handle up to 2,000 complete tins per hour.

The tins and their lids are conveyed in special carriers through the treatment. First a hot detergent wash, forcefully pumped inside and around the tin, washes away crumbs and removes the labelling and its fixative. Next is a hot water wash, followed by a scalding sterilising rinse, and, finally, the tins pass through a hot air chamber and emerge at the delivery end sterile and dry.

These machines are also made to handle tins with hinged lids.

Jar washing and drying machines for handling all shapes and sizes of new or used jars with labels or without in quantities up to 400 per min. are also made by Dawsons. The jars are carried through the machines in special holders travelling over batteries of washing and rinsing jets which deliver a strong cleaning treatment, and then through a hot air drying section, to emerge at the discharge point sterile and dry. Hand, semi-automatic or automatic loading can be provided with either hand or automatic unloading.

Machines are also available for washing and rinsing filled and capped (metallic closure) jars.

Spray Drying of Food

New American techniques

By A. E. Williams, Ph.D., F.C.S.

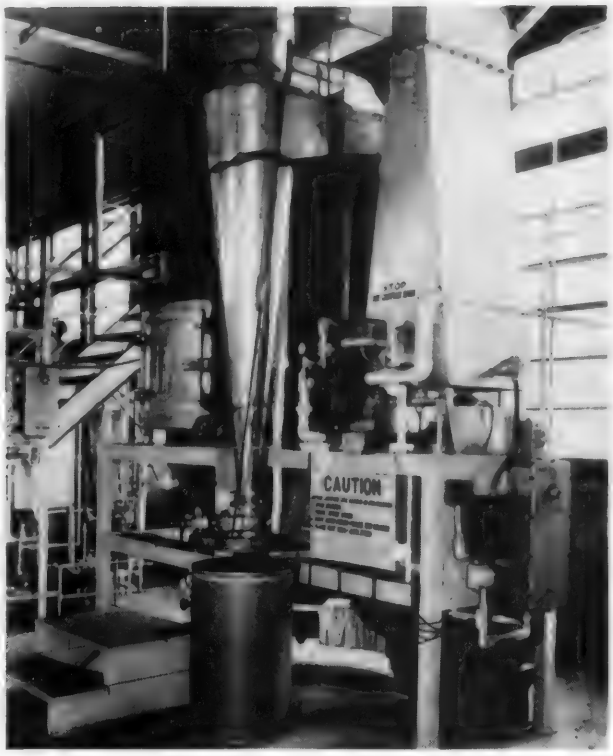
Recent developments in American spray drying practice help to cope with the demand for labour-saving foods that can be quickly reconstituted with water.

THE types of foodstuffs which are handled by spray drying techniques are constantly increasing and include eggs, egg albumen, yeast extracts, protein foods, milk and malted milk, malt extract, chocolate and its products, synthetic cream, infant foods, fruit extracts, and many others. Such heat-sensitive products maintain their desirable properties when dried by this method because the time of contact with an elevated temperature is merely a fraction of a second. The elevated temperature is limited to a maximum of around 95°F. as long as any moisture is present in the product, and for a given product the operating technique is so arranged that the maximum temperature attained for a split second cannot be higher than 95°F. because all the moisture is not expelled. A product that had been completely dried would quickly pick up moisture again from the atmosphere within a few minutes of exposure. Therefore, the fact that a few per cent. of water can be left in the end product is useful to prevent overheating during spray drying.

Products for spray drying are usually in the form of thin pastes or slurries, which have to be converted to minute particle size, or atomised. Simultaneously, the fine particles, as fast as they are formed, have to be brought into intimate contact with the elevated temperature, which is normally done by the use of a current of hot air. As the particles of product are so small, practically instantaneous evaporation of the water occurs. It then merely remains to separate the dried powder from the air. The bulk of the dried powder falls to the bottom of the drying chamber, from where it is constantly removed; the small proportion of powder carried over by the air current may be collected by the use of cyclones or textile filters.

Such features are common to most spray dryers, and plant designers have concentrated to a great extent on the procedure for atomising the product and how best to bring the minute particles into intimate but momentary contact with the hot air current. Since the war American designers have made some fundamental improvements in the practice of spray drying. In the U.S. the sale of spray dryers accounts for over six million dollars annually, due largely to the increasing demand for labour saving foods that can be quickly reconstituted with water. At least one American food-manufacturing concern has recently spent 250,000 dollars on a pilot plant to develop new spray dried food products. Much of the American spray drying industry is centred around the well-known engineering firm of Bowen Engineering, Inc., North Branch, New Jersey, which designs and fabricates spray drying plants for a number of products besides foods, including antibiotics, pharmaceuticals, chemicals, plastics, ceramics, pigments, dyes, metals, etc. The Bowen organisation works in close co-operation with its various clients and maintains an experimental section for probing any problems that may arise. This results in the food manufac-

(Above:) **Fig. 1—a laboratory size spray drying installation which also serves as a pilot plant for experimental batches.**



(Left): **Fig. 2—one of a battery of three Bowen spray dryers in an American factory. The drum in the foreground is under the cyclone collector, behind which is the conical-bottom drying chamber.** *(Right)*: **Fig. 3—the lower part of a 14 ft. dia. drying chamber; note welded rib construction to impart additional mechanical strength.**

turers receiving the type of spray drying unit best suited to their particular purpose. To a food manufacturer who has not previously done any spray drying, the usual practice is to supply, as a preliminary step, a laboratory size spray drying installation (Fig. 1) which may also serve as a pilot plant to produce experimental batches. When the problems connected with that specific food product have all been solved, a full-scale installation can then be made. This close co-operation of plant maker and food manufacturer allows the former to provide the exact type of plant needed for that particular job; while the food manufacturer can see for himself, and on his own premises, the quality of product he will be able to manufacture with the full-scale installation. Thus, he does not spend a great deal of money until he is satisfied that profits can be made. Where the manufacturer has already been producing a particular food product by other drying methods, he can compare his usual drying technique with that of the pilot spray unit.

Principle of operation

In the conventional design of Bowen spray dryer the food product in the form of a 45 to 50% slurry is fed to the atomiser unit, which is a horizontal centrifugal wheel rotating at the very fast speed of 20,000 r.p.m., which converts the slurry into a fog-like mist. This is projected into the hot air stream, induced by a fan at the outlet end of the plant, and heated by passage through a specially designed chamber, which, in turn, is heated by gas; no products of combustion enter the air stream. The drying chamber itself is conical bottomed and varies in diameter from a few feet to as much as 14 ft. (Figs. 2 and 3) according to the type of product handled. The heated air enters the drying chamber at the area around the centrifugal wheel. It picks up the minute particles and evaporates the moisture from them almost instantaneously. The movement of the product from the time it contacts the wheel to the time it is ready to leave the drying chamber is a matter of only a few seconds. For the drying of ultra-heat sensitive products, such as certain infant foods, which may suffer slight damage through the short period of contact with the hot air, this period is curtailed still further by the introduction of a cold air stream through ports in the chamber walls, which is a special feature of the Bowen units.

The dried product is collected in a cyclone collector to which it is conveyed by the air stream. In some installations two cyclones may be employed, the first collecting most of the product, but any that have escaped arrest in the first cyclone are caught by the second one. All parts of the plant which come into contact with the product are of stainless steel, and as the spray drying process is basically a continuous one, the output per unit of plant space is greater than with other drying systems.

Research helps the Manufacturer

Open Days at the Leatherhead Laboratories

No one who knows anything of the British Food Manufacturing Industries Research Association at Leatherhead, is unaware of the fine work which Dr. Banfield and his staff are carrying out, and of the prestige they have in the world of food technology. To allow the Association's members to see at first hand what goes on at Leatherhead and to meet the members of the staff, the Association's Open Days this year were on September 16 and 17, and we took the opportunity of visiting the laboratories once again to learn something more of the many projects which are being pursued with vigour.

To do justice to the many aspects of the Association's work in a few short paragraphs is impossible, and some examples culled at random must suffice. One project which attracted a lot of attention was the separation of cocoa and citrus oil constituents by vapour phase chromatography. This analytical method was introduced in 1952 by Drs. Martin and James for separating volatile acids; a sample of the product to be analysed is fed into a gaseous carrier stream that passes continuously through a heated tube packed with granules of a suitable inert packing material. The granules are coated with a high-boiling liquid, and by proper selection of this liquid, the sample to be analysed can be separated into fractions of pure compounds.

One method of measuring the concentrations of the separated fractions is by means of a thermal-conductivity detector element. This technique has been used on an industrial scale for separating citrus peel oils; the oils are recovered as an oil-water emulsion.

Gas chromatography is the most promising technique for the analysis of odours and flavours, the most difficult of food constituents to isolate. The reasons for this difficulty is not hard to find—the sensitivity of smell and taste organs being what it is, components present in amounts of the order of 1 p.p.m. are discernable, and flavours may be compounded of anything up to 50 constituents. A gas chromatography apparatus is capable of achieving a separatio of volatile mixtures with an efficiency greater than 1,000 theoretical plates.

Other work in progress in this department were the isolation of volatile flavour constituents by high vacuum distillation, and a study of the major glycerides of cocoa butter and fat bloom by paper chromatography.

In the meat and fish section we saw a display arranged in association with the Torry Research Station, D.S.I.R., Aberdeen, of work on herring, with particular reference to spoilage and canning problems. An apparatus used for studying the cooking properties of sausages was of interest; it consisted of a domestic frying pan mounted on an electric plate heater

Pictures taken on the B.F.M.I.R.A.'s open day. (*Top, left to right*): **Mr. J. P. Roberts demonstrates the gas chromatography apparatus. Mr. D. R. Butler operates the new viscometer for chocolate, designed in the laboratory (it is based on the Searle viscometer).** (*Bottom, left to right*): **The FIRA jelly tester for measuring jelly strengths is demonstrated by Miss A. E. Jarratt. An apparatus for studying the cooking properties of sausages; the rod-like device held above the frying pan is a thermocouple.**

of large area to provide uniform heating, and a thermocouple arranged to make contact with the bottom of the pan and so measure accurately the cooking temperature.

In the confectionery room we saw a new viscometer designed by the laboratory staff for measuring the viscosity of chocolate, and some studies of the piping qualities and stickiness of agar jellies in which spirals of jelly piping laid on a circular sheet of paper are spun on an electrically driven turntable.

Such are only a very few and by no means the most important of the studies in progress, which cover such diverse fields as the packaging of pickles and sauces, the equilibrium relative humidity of corn starch at high temperatures (a new apparatus is being constructed for this purpose), the drying of confectionery, rheological properties of fats, trace metals in foods, the separation of the constituent sugars of glucose, bacterial spoilage, and many others.

Ordinary membership of the Association is available to all British manufacturers, processors, preservers and preparers of food; food manufacturers in the Commonwealth, the Colonies and in Ireland are also eligible, subject to certain considerations. Firms engaged in wholesale distribution of food or in the manufacture of food processing machinery may join as associate members. Membership is grouped according to interest, and research within each group is guided by a committee elected by the group panel.

All ordinary members are entitled to appoint one representative to the panels dealing with the commodities covered by their interests.

Members receive regular confidential research reports, technical circulars and monthly abstracts of current scientific and technical literature, and can call on the services of the staff at any time to assist in specific problems. Annual subscriptions range from £24 (up to 24 employees) to £600 (2,000 employees and over).

Seaweed for Food

South Wales Laverbread Industry

SEVERAL marine algæ have for many centuries been used as a food by man, and the term "laver" is now generally applied to various marine algæ as a trade name for the edible species of seaweed. The economic value of algæ lies chiefly in the gelatinous matter or gelose which is contained in the cell wall. An important species of seaweed is *Chandrus crispus*, the use of which is of considerable antiquity and has found practically world-wide use. Under the name of "carrageen moss" it is one of the commonest algæ of the British shores and generally occurs in the zone extending from low tide of neaps to that of springs. When boiled in water, a fundamental change takes place in structure and the seaweed practically dissolves; on cooling, it forms a gelatinous mass which has found many uses, such as in the preparation of jellies, as a thickening agent for textiles, as a vegetable glue, and, during the war, as a substitute for gelatine of animal origin. On the Anglesey coast of North Wales, it has found much application as a cattle food.

A process has been developed in Germany for the extraction of a type of edible fat from seaweed, and it is claimed that its characteristics are not far removed from those of olive oil. In the Orient, certain algæ are highly esteemed as foods and are used in making blancmange and other puddings, in soups, and as condiments. The most widely used is the red algæ porphyra. In Japan, porphyra is cultivated on suitable tide lands, which are prepared for cultivation by implanting numerous bundles of bamboo in which the water is 15 to 25 ft. deep. The bundles afford a lodgment for spores of porphyra floating through the water, and the spores eventually develop into plants with blades several inches in diameter.

"Komba," a product made from a particular type of seaweed, is one of the standard foods of Japan. During the winter season, seaweed is gathered in small wooden tubs in Tokyo Bay, *Porphyra temera* being favoured, the material being collected by men on stilts, a very picturesque affair. The industry has latterly become highly organised, and areas are now licensed or leased by the Tokyo Metropolitan Authorities. In some of these areas, the beds are now seeded with tiny seaweed spores which have previously been developed during the course of about four weeks in sea water in protected areas or fields. The early cultivation is largely carried out off the coast of Chiba, south-east of Tokyo. In some areas nets are used as a foundation for growing the seaweed, the latter becoming heavily covered during the course of about six months. Seaweed and tea are related products for cultivation in many districts of Japan. It is in Japan that seaweeds in general are put to the greatest number of manufacturing uses, being employed as foods, plaster and glue, as starch, and as a manure in the rice fields. The well-known "kanten" is a seaweed isinglass familiar in this country as agar-agar, which finds such wide application as a culture medium for bacteria. An edible agar-agar is used in the clarifying of wines in France and South Africa.

In South Wales, the laverbread industry is of great antiquity, and is known locally as "bara lawr." Largely because of local sea pollution, the bulk of the red seaweed, porphyra, used in its manufacture is now imported from coastal regions outside Wales. At the present time practically the only local weed collected is boiled in small quantities by villagers for consumption amongst friends. There is one such instance at the Mumbles, near Swansea, where about 12 lb. of laverbread are made weekly from weed collected

from the beach. This practice of individual laverbread making is rapidly dying out, being replaced by bulk manufacture for distribution to market and shops, for market day and week-end sales. The supply of seaweed required for this large-scale manufacture is maintained by permanent collectors from certain strips of coast line, largely Cumberland and Cornwall in England, the Stranraer and Dunbar regions of Scotland, and smaller quantities from Southern Ireland and south-west Wales. M. A. Hampson, of the Fisheries Laboratory of the Ministry of Agriculture, Fisheries, and Food at Lowestoft, has recently published the results of an investigation of the laverbread industry and also of the laverweed. Mr. Hampson estimates that about 4,250 cwt. of laverweed is now being supplied to the South Wales laverbread manufacturers annually, 50% of which comes from Stranraer, 20% from Cumberland, 8% from Cornwall, 8% from Barrow, and the remainder from Dunbar, Ireland, and North and South Wales. The Stranraer product is actually collected along the Irish Sea coast in the vicinity of Port Patrick and along the west side of Luce Bay, at Port William, and Monreith Bay. The small quantity collected in South Wales comes mainly from the Milford Haven area. The seaweed is supplied to 13 establishments in and near Swansea, and in recent years markets for laverbread have been extended to a few English cities and towns, including Birmingham, Coventry, Bristol, Reading, Slough, and Bournemouth, largely towns where Welsh communities are situated.

Processing

The seaweed is first thoroughly washed to remove all sand and foreign matter, the more tenacious sand being removed from twisted sections and "knots" by hand. This cleaning is extremely important, as the presence of any sand in the finished product is highly detrimental. The weed is then boiled for 12 hr. in 6 cwt. capacity "coppers" or boilers; salt and water are added during the boiling to the extent of about 3 lb. of salt and 20 lb. of water per cwt. of seaweed. A particular technique is acquired after years of experience which is generally handed down from generation to generation through a family business.

The spring growth seaweed is tender whereas the winter product is tough, and each requires totally different treatment. When the product is considered to be sufficiently "cooked," it is removed from the boiler on to a stone slab or often a slate slab, in many cases an old billiard table top foundation. The product is then allowed to cool for about 12 hr., minced, and colouring matter added to bring to a standard colour.

The final laverbread is a shiny gelatinous mass with a pleasant flavour of the sea. It is always prepared for eating by being warmed in fat, and is sometimes first made up into small cakes coated with oatmeal. It normally takes the place of eggs, etc., with bacon for a breakfast dish. Consumers have great faith in its qualities as a source of iodine in goitre treatment, as a dietary source of iron and other trace metals and also in the fact that it is a mild laxative. At the Swansea market at the present time, there are several stalls at the week-end where only laverbread is sold. It is also retailed by the cockle women of Penclawdd on their week-end rounds of the Welsh valleys.

New Dehydration Method for Fruit and Vegetables

A NEW method of dehydrating fruits and vegetables is revolutionising one of the oldest food processing techniques for growers in the United States.

Developed by the Western Regional Research Laboratory of the U.S. Department of Agriculture, Albany, Calif., it makes use of a stainless steel mesh conveyor belt as a continuous moving trough for fresh produce. This makes it possible to force hot air up through the wire mesh of the belt to accelerate dehydration.

The classic method of dehydrating fruits and vegetables involves the use of wooden trays and warm sunlight. Besides being slow, this makes it possible for produce to be contaminated with wood slivers and other foreign matter.

Continuous stainless steel conveyor belt shown here now permits the rapid dehydration of fruit and vegetables with warm air in the U.S.A.

Because standard conveyor facilities could not be used, the Cyclone Fence plant of U.S. Steel Corporation at Oakland, Calif., were able to make the new process practical by designing a special belt.

Primarily, this belt is a woven wire product with chain-drive construction. It virtually eliminates heat losses by allowing free air circulation, yet its mesh is not too coarse to retain the smallest types of fruits and vegetables. Consequently, dehydration can now be accomplished more than four times faster than was previously possible.

Faster dehydration not only saves time and money; it allows foods to retain better colour and flavour in storage. It also does away with the problem of food sticking to wooden trays and greatly reduces the possibility of contamination.

Apples, apricots, carrots, potatoes, and bell peppers are typical fruits and vegetables being dehydrated by means of the new process.—THOMAS A. DICKINSON.

Advances in Food Technology

ANTIBIOTICS

Beef Application Methods

The effectiveness of chlortetracycline was shown and various methods of applying the antibiotic for such use were compared.

The ability of the antibiotic to extend the selling qualities of beef was dependent upon its level in the meat and the level was, in turn, related to the application method. At the amounts used, CTC was most effective when administered by both an intravenous injection to the live animal immediately before slaughter and as a spray immediately after slaughter. In order of decreasing effectiveness were the injection, the spray and finally the treated Cellophane methods of application.—M. C. Firman, H. J. Bachmann *et al, Food Technol.*, 1959, **13** (8), 529.

CEREALS

Protein Determination

The use of boiling tubes instead of flasks for Kjeldahl digestions is described. These are held in a specially designed duralumin block which is heated either electrically or by gas. In the distillation process the ammonia is distilled into 2% boracic acid and titrated directly with a mixture (5 : 1) of bromocresol green and methyl red as an indicator.—J. Janecki, E. Kaminski and R. Ozog, *Getriede*, 1958, **8** (12), 89.

DAIRY PRODUCTS

Butter Structure

It has not been possible, so far, to gain adequate knowledge of the physical structure of butter, even by means of light-microscopic investigations, mainly because of the small size of the particles. On the other hand, it is also difficult to use an electron microscope for this purpose, either because the particles, in this case, are too large or because the preparation of the sample is accompanied by marked physical or chemical changes, or because the nature of the phenomena is such as to preclude the use of an electron microscope.

Microscopic investigations with polarised light appear to show the existence, in the butter, of certain crystal-like structures, normally regarded as "intact fat globules."

Further research at the German Federal Institute for Milk Research, Kiel, has shown that these phenomena are not due to anisotrope crystals but to the formation of boundary surfaces between substances with different indices of refraction. The degree of crystallisation can, in fact, hardly be ascertained by means of polarisation-microscopic observation alone. Such investigation calls for a micro-structure analysis by means of X-ray apparatus, combined with goniometer equipment. With the aid of this method, it is possible to quantify the influence of fat composition, solidification temperature, storage temperature, storage time, etc., on the crystallisation of the butter fat.—E. Knoop, E. Samhammer, *Deutsche Molkerei-Zeitung*, 1959, **80**, 1031.

Frozen Concentrate

The development of a method for the preparation of frozen concentrates of *Lactobacillus acidophilus* for therapeutic use is described. A supplementary whey medium which supports excellent growth and permits the efficient recovery of the cells by centrifugation was also developed.

Studies on preservation methods showed that cells concentrated from a whey medium can be "quick frozen" and stored for six months with only a slight loss in viability.—D. E. Duggan, A. W. Anderson and P. R. Elliker, *Food Technol.*, 1959, **13** (8), 465.

Fat Content

Two reagent solutions are described for determining the fat content of milk and dairy products. One is an alkaline solution which may be used with or without centrifugation and gives results in good agreement with the Gerber method, while the other is a neutral non-corrosive solution. The latter, when compared with standard methods, gave satisfactory results for 306 samples of milk and 186 samples dairy products.

After prolonged use the alkaline solution was found to attack the butyrometers. The technique of the test with the neutral solutions is described as simple and its cost is stated to compare favourably with that of the Gerber test.—F. J. MacDonald, *Analyst*, 1959, **84** (998), 287.

FRUIT

Sugar Determination

For the hydrolysis of sucrose in fruits containing 60-70% of fructose in the total sugar the following conditions were suitable—0.1% hydrochloric acid, 20 to 30 min. in a boiling water bath; 2.4% hydrochloric acid, 8 to 16 hr. at 30°F., 4 to 8 hr. at 40°F., or 45 to 60 min. at 50°F.

No appreciable decomposition of fructose was observed. The determination of invert sugar was effected by Somogyi's method.—Kazuo Osodo, Hidejiro Kazumi, *et al., J. Agric., Chem. Soc. Japan*, 1959, **100**, 695.

Enzyme Treatment

Use was made of an enzyme preparation called *Naringinase C* in studies carried out to ascertain the optimum constituent in grapefruit pulp and juice to the less bitter substances, prunin and naringen. The best conditions were found to be 50°C., *p*H 3.1, enzyme concentrations of 0.5 – 0.1% and incubation periods of 1-4 hr.

The enzyme action at a low temperature, 4°C. for 44 hr., hydrolysed naringen to less bitter prunin, without a corresponding decrease in Davis test value. Enzymatic hydrolysis of coloured grapefruit pulp at 50°C. for 1½ hr. at 0.025% concentration reduced the bitterness and enabled the pulp to be used for the fortification of poorly coloured, late season fruit juice.—F. P. Griffiths and B. J. Lime, *Food Technol.*, 1959, **13** (8), 430.

POULTRY

Broiler Darkening Prevention

Studies concerning the darkening of meat near thigh and leg bones of young chickens during freezing, thawing and cooking have revealed that the kind of feed, method of bleeding, rate of chilling, and time in frozen storage had little or no influence.

Meat discoloration was prevented by heating the chicken parts to an internal temperature of 180°F. before freezing. This was accomplished by, in order of preference, heating with microwaves, steam at 10 lb. pressure, steam at atmospheric pressure, radiant heat oven at 350°F. Heating with microwaves was highly efficient, requiring 2-3 min., and resulting in 18.6% weight loss and heating with steam pressure required 5 min. and gave a 16.5% weight loss, but the other methods were less desirable. Darkening was increased by allowing the chicken to thaw completely before heating.

Chicken heated with microwaves (4 or 5 pieces at a time) for more than 3 min., or with radiant heat for more than 25 min., and then wrapped individually in aluminium foil and held for 2 years at 0°F. was rancid and stale. Larger pieces retained flavour and freshness much better than small pieces.—Cordelia Ellis and J. G. Woodroof, *Food Technol.*, 1959, **13** (8), 533.

MILK

Dialysis

Concentrated skim milk was exhaustively dialysed against water and the product spray-dried. The dried material, which contained 86·5% protein, was readily dispersible in water and had a bland flavour.

The sodium and potassium levels were considerably reduced by dialysis, but the level of calcium did not change greatly. Continuous dialysis removed less than half of the lactose under the conditions employed, but the sodium and potassium concentrations were reduced rather more. Results suggest that, under commercial conditions, a battery of continuous dialysers would be required to reduce the lactose to a sufficiently low value.

The commercial implications of dialysed milk are discussed briefly.—R. Beeby and J. W. Lee, *Aus. J. Dairy Technol.*, 1959, **14** (1), 12.

MEAT

Analysing Nitrate Content

A polarographic method of determining the nitrate content of meat and meat brine is described. It is based on the nitration of phenoldisulphonic acid and subsequent electrolytic reduction of the nitro compound at a dropping-mercury electrode, the diffusion current being equal to the concentration of nitrate originally present. The effects of nitration time and interfering substances, such as chloride, nitrate and amino acids, the completeness of the nitration reaction and reproducibility have been investigated.

The method is described as being suitable for the determination of nitrate in brines contaminated with proteins.—J. H. Dhont, *Analyst*, 1959, **84** (999), 372.

MEAT PRODUCTS

Structure Preservation

The processing of canned meat and sausages still has to cope with certain difficulties, including a certain degree of segregation of the main constituents (fat, protein, jelly), and a partial reduction in the quality of the protein, due to heat influences. Extensive microscopic investigations, carried out at the Physiological-Chemical Institute of Heidelberg University, on the behaviour of protein substances during the preparation and stabilisation of fat emulsions have shown that the homogeneous structure of the product can be preserved, its nutritive value increased, and its flavour improved, by using native protein substances of full biological value as auxiliaries.

A certain proprietary brand of protein concentrate has been found to suit these conditions perfectly.—Professor Kutscher and W. Pfaff, *Die Fleischwirtschaft*, 1959, **11**, 568.

Brine Micro-organisms

According to research carried out at the German Meat Research Institute, Kulmbach, the number of different species of micro-organisms encountered in typical curing brines is limited. An examination of 225 different curing brines showed the presence of about 45 different species, belonging to 23 genera. Depending on the predominance of certain species, it is possible to distinguish five types of brines. The bacterial count depends greatly on the sodium chloride concentration of the diluent liquid and of the medium, as well as on the incubating conditions.

A suitable method of counting is to use a 10% NaCl solution as diluent and special agar with a 6% admixture of NaCl which is aerobically incubated at 25°C. for six days.—L. Leistner, *Die Fleischwirtschaft*, 1959, **11**, 726.

Continuous Sausage Machine

A new machine, made in Germany, permits the continuous processing of dry and cooked sausages. According to tests carried out at the German Meat Research Institute, Kulmbach, the quality of the sausages thus produced is better than with conventional methods. Dry sausages showed less creasing, more attractive appearance, reduced porosity, better taste and, partly, better flavour. In some cases, however, weight losses were found to be higher. Improvements were also ascertained with other types of sausages produced by the new machine.—W. Gisske and G. Nitsch, *Die Fleischwirtschaft*, 1959, **11**, 350.

Curing Brines

Systematic research has been carried out jointly by several German research institutes in order to determine the oxidation-reduction potential of curing brines. For this purpose, some 150 different curing brines were measured electrometrically by means of specially developed apparatus. The measurements revealed the existence of a correlation between the curing properties of an immersion brine and its oxidation-reduction potential. The latter can therefore be used as a criterion for the curing properties of a given immersion brine.—L. Leistner and A. Mirna, *Die Fleischwirtschaft*, 1959, **11**, 659.

Boiling Temperature Influence

Finnish research workers have found that, during boiling, the temperatures inside Frankfurter-type sausages generally remained below the water temperature, reaching it only for a few minutes if at all. This heat, though sufficient to destroy the gram-negative and most of the gram-positive flora of Frankfurter-type sausages, is not strong enough to eliminate certain micro-coccaceæ which not only survive this process but may in fact be stimulated by it to some extent.— F. P. Niinivaara, M. S. Pohja, Dr. W. Kreuzer, *Die Fleischwirtschaft*, 1959, **11**, 157.

PRESERVES

Long Storage Effects

A sample of home-made strawberry preserve packed in 1915 was examined by the Department of Food Technology of the University of Massachusetts. The closure was extremely corroded along the inside of the rim but only slightly on the outside. The contents were covered by a layer of wax. The preserve itself was very dark brown in colour and composed of lumps of fruit and gel in a medium of dark brown syrup. Samples of fresh strawberry preserve and some two years old were used for comparison.

The inversion of sucrose in storage evident from the comparisons was not found to be carried through to completion over the 43 year period. Degradation of the monosaccharides continued as was indicated by a very high ultra-violet absorption and the reduced sugar content.

It was concluded that the practice of using S.T.H.T. storage (at 100°F.) to simulate the chemical changes taking place during prolonged storages seemed to be justified; flavour changes which occur under the accelerated conditions might not parallel those taking place over a longer time at lower temperatures.—G. E. Livingston and C. T. Tan, *Food Technol.*, 1959, **13** (9), 526.

PROTEINS

Gliadin Studies

Crude gliadin, prepared by the extraction of gluten with 0·07*M* acetic acid or with 70% aqueous ethanol, contains, to about 90% of the mass of the extracting material, a component which appears homogenous in the ultracentrifuge. This may be called true gliadin and it is obtained in small yield through fractional precipitation of a solution of crude gliadin in 60% ethanol. It has a molecular weight of about 25,000 as determined by the ultracentrifuge or by light-scattering methods.

Despite a marked hydration tendency, gliadin at neutral reaction showed a strong aggregation tendency through intermolecular hydrogen bonds. While water cannot successfully compete with this intermolecular cross-bending to carry the gliadin into molecular solution, the imposition of a small charge on the protein, in absence of other electrolytes, or the addition of urea in an amount of a 1- to 2-molar solution, will do so. Under these conditions, the molecular kinetic properties of gliadin can be studied. Evidence is presented that the sites of molecular cross-linkage involve the amide groups of the protein.—John Holme and D. R. Briggs, *Cereal Chem.*, 1959, **36** (4), 321.

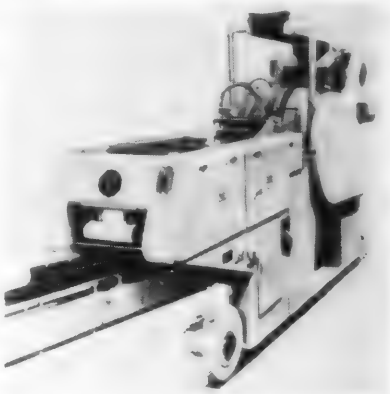
Machinery and Equipment

DOUBLE U MOULDER PANNER

This machine, made by Baker Perkins, Ltd., was shown at the Bakers' and Confectioners' Exhibition and is used for the production of 1¾ lb. four piece bread, and moulds a single piece of dough into the formation required before passing it automatically into the bread pan. The drum moulder has three pairs of feed rolls, each 12 in. long. The drum itself is 18 in. wide and 3 ft. in diameter, with triple necking vanes fitted round the latter part of the drum travel. The maximum length of dough piece obtainable from this machine is 17½ in., said to be ideal for four piece bread.

A patented roller transfer is fitted from the drum delivery point to the panner band. This is specially designed to keep the dough piece square to the band travel. The panner band is 18 in. wide.

The folding of the dough piece begins with side pressure from two converging side guides which turn the outside segments of the dough piece back. A pressure belt above the band trips the centre pieces to keep them parallel. A centrally placed driven finger engages the centre necking to hold back the centre piece while the outsides catch up.



The Baker Perkins Double U moulder panner for producing 1¾ lb. four piece bread provides a fully-automatic link between dough mixing and baking.

MEAT CUTTER

A machine which cuts up frozen meat at a rate of up to 7 to 9 tons per hr. has been introduced to this country by Foodtech, Ltd., who say that the machine is safer to use than the usual guillotine.

Blocks of frozen meat or offal can be fed into the machine in pieces up to 20 in. wide and 10 in. high and come out as pieces with a standard width of 2 in. and thickness of ¼, ⅜ or ¾ in.

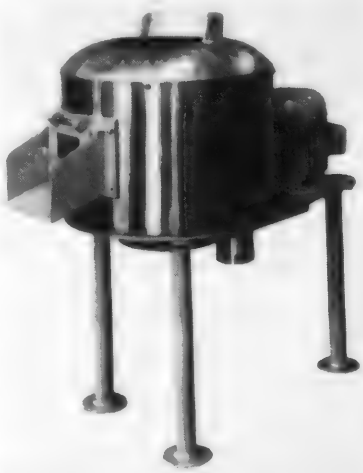
The machine, which is fitted with an oil bath drive, is powered by a 7·5 h.p. motor. It is claimed that the machine can be easily kept clean as it is of all-welded construction.

COLLAPSIBLE CONTAINERS

Collapsible containers made of rubber reinforced with nylon are now being produced by the Dunlop Rubber Co., Ltd., for the conveyance of edible fluids in bulk. The containers, which are flat when empty, can be rolled up and strapped to the cab of a lorry, thus leaving it free to carry other goods on its return journey. When full, they assume a stable pillow shape, and can be held in position by means of either a tarpaulin secured by ropes, or a special nylon harness.

The makers say that the use of nylon in the construction of the containers ensures that they are comparatively light in weight, are rot-proof and have a high degree of tensile strength. The fabric is coated on one side with neoprene, a synthetic rubber, and on the other with a variety of natural, sweetened or synthetic rubbers, according to the liquid to be carried.

The standard container is fitted with an adaptor for a hose fitting and this incorporates a non-return valve, through which it is filled and emptied.



The onion peeling machine made by Wm. Brierley, Collier and Hartley and demonstrated recently at the B.F.M.I.R.A. laboratories.

A small manually-operated release valve allows for the escape of any air introduced during filling. Liquid can be completely removed by siphoning, and when necessary the container can be sterilised with boiling water.

The containers are available for general purposes in standard capacities of 250, 500, 800 and 1,000 gal., but can also be made in a variety of dimensions, according to customers' specifications.

ONION PEELING MACHINE

An onion peeling machine, claimed to be the first in the world to do the job successfully, was demonstrated recently at the B.F.M.I.R.A. laboratories at Leatherhead before an audience of interested manufacturers.

The machine, which is made by Wm. Brierley, Collier and Hartley, Ltd., is basically composed of a stainless steel drum with a revolving carborundum-faced base plate at the bottom. The onions are fed in at the top in batches of about 20 lb. and are removed from the machine after between 50 and 90 seconds, according to the hardness of the peel. Water is sprayed on the onions while the machine is in operation to remove the dirt and the peelings. Three deflectors inside the stainless steel drum direct the onions towards the centre of the revolving plate and the onions are removed by a hatch at the front of the machine.

The machine is powered by a 1 h.p. electric motor and the base plate revolves at about 250 r.p.m.

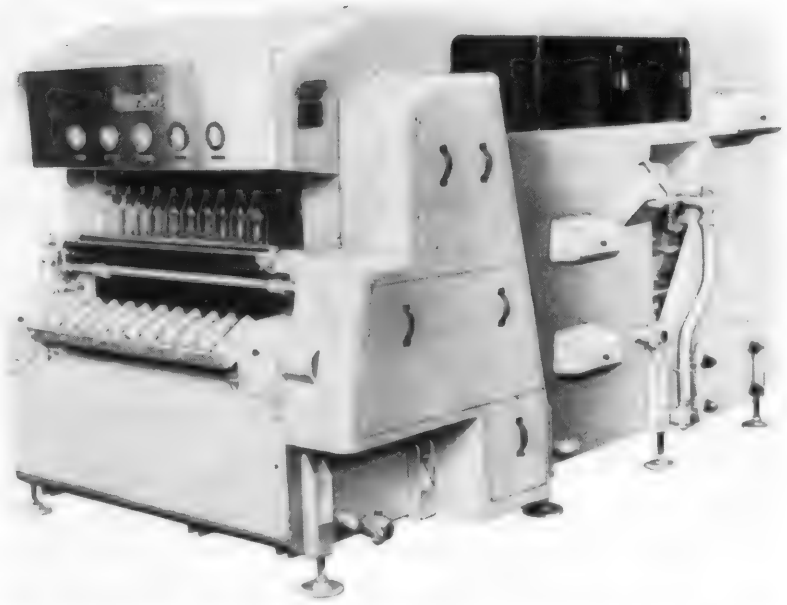
B.C.H. say that the machine is also being used for peeling beetroot. For this purpose the base plate with its 70 grade carborundum surface is replaced with one of 100 grade. An output of about 6 tons of beetroot per day is possible.

DEMINERALISED WATER UNITS

Water demineralising, or de-ionising, units rely on detachable cartridges of ion exchange resins which are returned to the supplier when exhausted.

The marks 4 and mark 5 portable *Deminrolit* plants manufactured by the Permutit Co., Ltd., have been designed for on the spot regeneration of the exhausted ion exchange material, thus obviating the need for detachable cartridges and replacements. Running costs are stated to be less than a ¼d. per gal. of demineralised water produced.

Both plants consist of a pair of sealed columns charged respectively



The "New Classic" come-back soaker hydro bottle-washing machine is the latest addition to the Dawson range.

with *Zeo-Karb* cation and *De-Acidite* anion exchange resins, the water being passed through the columns in that order. Flexible connection and delivery tubes, with a multi-valve control system, facilitate operation and regeneration. A built in dial type conductivity tester enables "spot" checks to be made on the quality of water being produced. By this means the point at which regeneration becomes due may be determined precisely.

Regeneration involves flushing the cation column with a dilute solution of hydrochloric acid and the anion column with dilute caustic soda or soda ash solution. Both columns are then rinsed with water when the plant is ready for further use.

Either plant is available as type E or type F, the difference being in the type of resin used in the *De-Acidite* column. The former produces a demineralised water comparable to commercial distillate while the latter produces a much higher quality.

Output between regenerations will depend on the raw water quality—that from the type F. plants being somewhat less than that obtained from type E. Using London Area mains water the output from a mark 5 E plant will be approximately 50 gal. while the same plant using Manchester water will produce about 300 gal.

Flow rates are unaffected by the type of plant or quality of the raw water; the mark 4 produces demineralised water at about 11 gal. hourly—the mark 5 about 6 gal. hourly.

The mark 4 is mounted in an upright tubular framework on a small, rubber-tyred, two-wheeled undercarriage. The smaller mark 5 is equipped with a carrying handle and is designed for bench level operation.

Both plants are constructed throughout from non-corrodible materials and operate at normal cold water tap temperatures and pressures.

BOTTLE-WASHING MACHINE

The latest addition to the range of bottle-washing machines made by Dawson Bros., Ltd., is the *New Classic* which is built with the feed and discharge at one end. The model is available in two sizes, one handling pint or ½ litre bottles at a rate of 4,800-8,400 per hr. and the other handling quart or litre bottles at 4,800-7,200 per hr. Bottles are fed in semi-automatically or an automatic feed may be fitted on the larger machines.

The bottles are presoaked at 90°F. (33°C.), after which they enter a detergent soak at 145°F. (62°C.), followed by a detergent wash at the same temperature.

All traces of the detergent are removed by a fresh water rinse at 100°F. (38°C.). Finally the bottles are rinsed inside and outside with cold water. Draining follows before automatic discharge from the machine.

For sterilised milk bottles the treatment is the same except that the temperature follows a continually ascending temperature gradient.

The plate type heat exchanger and the automatic thermostatic valves are located at the rear of the machine; the pump unit is located at the side on the machine; and the variable speed drive unit is under cover at the feed and discharge end.

POWDER FILLER

The new model G Perry *Accofil* patented powder filling machine designed for the aerosol trade has been introduced by the Flexile Metal Co., Ltd., who are the representatives for the manufacturer, Perry Industries Inc., Brooklyn, New York.

The machine consists basically of a bulk hopper into which the powder is placed. This hopper is positioned over a die wheel (filling head) which may be adjusted to fill containers ranging from 1½ in. to 12 in. in height, and ¾ in. to 6 in. in diameter. Round, square or oval containers can be filled without, it is claimed, dusting during the filling operation. Twin agitators, located in the hopper and hopper well, keep the powder from caking or bridging while being fed to the die wheel.

Rotating either clockwise or counter-clockwise below the hopper is the die wheel or filling head which is equipped with 2, 4 or 8 ports depending upon the size and speed of fill required.

The ports are equipped with pistons, the heads of which have a sintered stainless steel or felt disc which permits the passage of air, but prevents powder from passing through. The pistons are adjustable within the ports in order to obtain the desired weight of fill to be placed into the containers. When any one port of the die wheel is positioned under the hopper, the vacuum cycle draws the powder into the port as well as removing any trapped air.

When the powder-filled port revolves into position over the container to be filled, the cycle automatically changes from vacuum to pressure and forces the slug of powder from the port into the container.

The containers may be hand-fed and filled at 15-20 per min. or a conveyor may be used to make it fully automatic. Size of fill ranges from part of a gram to 25 lb.

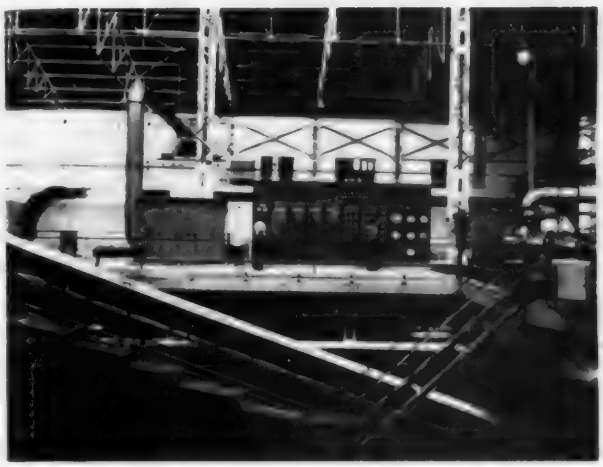
TRUCK

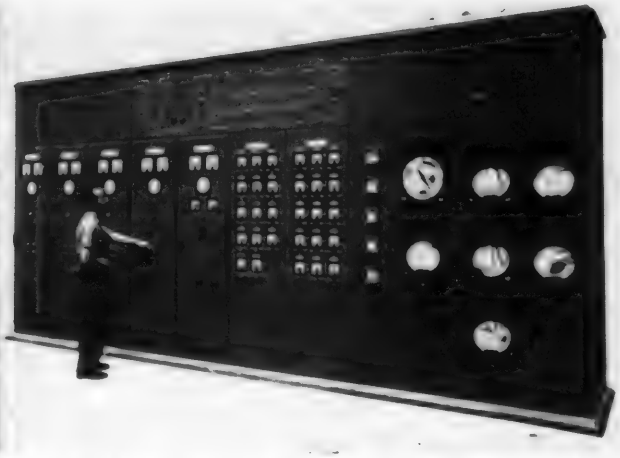
Introduced by Tool Treatments (Chemicals), Ltd., the *Mini-Bogie* truck is believed to present a quick, easy and economical method of man-handling a wide range of commodities within factories.

A high density rigid polythene container size 18 in. × 15 in. × 13½ in. is mounted on a transporter that can be easily pulled along the straight or swivelled round on its own axis to negotiate awkward spaces.

The polythene container is suitable as a carrier for chemicals and corrosive materials or other products that can be easily contaminated and is also suitable for the food trade. The polythene tank, made of steriliseable high density material, is supplied separately and being stackable provides a very convenient method of storage.

The handle of the truck can be used fully extended or can be retracted in its container for pushing.





The Irish Sugar Co.'s new beet processing plant at Carlow (*left*) is designed for continuous operation under automatic control, and processes 125 tons of beet per hr., with many variables controlled from the instrument panel (*right*), which is instrumented by Honeywell Controls, Ltd.

SUGAR PROCESSING

The Irish Sugar Co. are this year expecting bigger yields at less cost from their beet processing plant at Carlow, Southern Ireland: for the first time the 3 month round-the-clock production campaign that follows the annual beet harvest is running continuously under fully automatic control. Recording and controlling instruments, supplied by Honeywell Controls, Ltd., are said to maintain process conditions at a stable optimum, and ensure such effective use of available heat energy that the plant's fuel bill has already been cut.

Instrumented continuous processing through a new 200 ft. long diffusion drum replaces batch processing, stepping up feed rates to an average of 125 tons of beet per hr.

In the rotating drum, which is the heart of the diffusion process, pulped beet and water are moved in opposite directions by helical convolutions inside the drum.

A continuous mechanical weigher measures the weight of beet on a certain section of the conveyor belt at any moment. The vertical movement of the belt under the weight of beet is used to move the slidewire on a potentiometer, the voltage of which is generated by a tachometer generator in contact with the moving conveyor belt. By combining the measurement of weight and speed in this way, operators obtained a measure of feed rate in tons per hr. which is registered on an *ElectroniK* potentiometer recorder.

Water input is measured by means of orifice plates and a differential converter transmitter, and controlled by a pneumatic recorder with *Air-O-Line* pneumatic control.

A feature of the new system is the continued circulation of the sugar solution obtained at the beet input end of the drum. Known as the circulation juice, the solution is tapped from the drum, heated to a controlled temperature, and used to raise the incoming beet to the required extraction temperature of about 75°C. This use of the circulation juice as a heating medium, combined with the control of the steam valve to the heaters, is said to ensure maximum use of available heat energy together with maximum fuel economy. The temperature control system consists of a filled system temperature transmitter *Tel-O-Set* miniature pneumatic controller and diaphragm control valve. A similar system regulates heat input to the supply water heaters at the other end of the drum.

The feedwater to the drum is acidified in the feedwater tank to the optimum processing *p*H valve of approximately 5·5 by an automatically controlled flow of acid. Although no *p*H instrumentation as such has yet been installed on the plant, acid is supplied in a set ratio to the flow of water into the tank. The water flow is measured by a differential converter which feeds a pneumatic controller regulating acid supply by means of an acid addition pump.

At the output end of the process, the product is tapped from the circulation juice tank according to the liquid level in the tank. The control system consists of a liquid level differential converter, pneumatic receiver controller and diaphragm control valve. The circulation juice, which speedily increases in sugar content from continued contact with unprocessed beet, is passed from the liquid level control valve to further treatment processes—liming, carbonation and crystallisation.

The instrument panel presents operators with a continuous record of each of these controlled variables, together with temperature indication from certain points in the plant, and flow and temperature records from subsequent stages in treatment.

GEARBOXES

Electropower Gears Ltd., have introduced a new range of vertical flange and foot mounting gearboxes, giving 2 or 3 speeds by change ratio. These are supplied as gearboxes only for direct coupling or belt drive, or as motorised units with, if required, 2, 3 or 4 speed electric motors, giving up to a maximum of 12 different speeds. The range covers from ½ to 150 h.p. approximately.

To supplement their existing standard range of *Slo-Rev* units, this new range of gearboxes can be offered as a *Slo-Rev* unit to give 2 or 3 speeds at very much reduced revolutions.

LIFT TRUCKS

A series of redesigned cushion-tyre lift trucks of 3,000, 4,000 and 5,000 lb. capacity, designated *SpaceSaver* 30, 40 and 50, have been introduced by the Hyster Co.

The trucks are fitted with Hyster's *Monotrol*, a control system which features forward-reverse selection and throttle in a single right-foot pedal, push-button automatic parking brake and "drive" control, safety starting and left-foot inching and brake pedal.

By elimination of hand shift levers, the driver's left hand is available for full-time steering, greatly improving control and ease of operation. A 4-cylinder engine gives an output of 50 h.p. at 2,600 r.p.m., and 125 lb.-ft. of torque at 1,200 r.p.m.

In addition to the popular Power-Shift Hystamatic transmission with *Monotrol*, a two-speed, constant-mesh unit is also available. New type self-adjusters in brake line circuit automatically maintain proper shoe to drum clearance throughout lining life.

A new hydraulic pump gives lift speed under full load up to 68 ft. per min. for the 30 and 40, and up to 53 ft. per min. for the 50.

News Digest

Standards Committee scrutinises Milk Bread

The Food Standards Committee has issued a report making recommendations regarding the description, composition, and labelling and advertising of bread containing milk ingredients. It takes account of evidence received from interested organisations, including those concerned with the enforcement of food and drugs legislation.

The majority of the committee would allow the description "milk bread" to be used for bread containing either whole milk solids or skim milk solids to an agreed standard, but the minority prefer the description "dairy bread" for the product made with skim milk. Unanimous agreement on a minimum standard for these products of 4·2% of whole milk solids or skim milk solids calculated on the weight of the loaf has been agreed upon though.

It is recommended that if the description "milk bread" is permitted whichever kind of milk constituents are used, labels and advertisements should carry a declaration, "contains whole milk solids" or "contains milk-solids-not-fat," as the case may be; where the bread is sold unwrapped, a notice to the same effect should be conspicuously displayed in the shop. They also propose that, apart from the description "milk bread," the use on labels or in advertisements of words or pictorial devices suggesting that bread made with skim milk contains whole milk should be prohibited. The Committee consider claims that "milk bread" is rich in any of the nutrients contained in milk should not be allowed, although they see no objection to factual statements of the percentage of milk solids or milk protein present.

The report is submitted to the Minister of Agriculture, Fisheries and Food, the Minister of Health, the Secretary of State for Scotland and, for Northern Ireland, the Secretary of State for the Home Department.

If interested parties have any views on the recommendations which they would like considered they should address them to the Assistant Secretary, Food Standards, Hygiene and Slaughterhouse Policy Division, Ministry of Agriculture, Fisheries and Food, Great Westminster House, Horseferry Road, London, S.W.1, to arrive not later than December 10, 1959; that Ministry will co-ordinate representations from all parts of the U.K. The report is not at present available in printed form; duplicated copies may be obtained on application to Room 467 at the address given above.

National College of Food Technology

For the first time, courses are being held in the new National College of Food Technology buildings which have recently been built at Weybridge, Surrey. The new college is residential with accommodation in the hostel for about 80 students, almost wholly in single study-bedrooms. A large assembly hall, a lecture theatre, refectory, library, reading rooms and common rooms are among its other amenities.

The food processing laboratories have been equipped with pilot scale plant and provide facilities for practical instruction in all the major food processing operations such as canning, refrigeration, quick-freezing, evaporation, dehydration, emulsification, pasteurisation and sterilisation.

The science laboratories have been provided with all the necessary equipment for postgraduate and other advanced level courses of study in food science and technology. There are research facilities for both staff and qualified students.

The college offers three postgraduate courses, a four-year Associateship sandwich course and a two-year full-time Diploma course in food technology. There is close co-operation between college and industry and many leading food manufacturers send employees to the courses and provide industrial training for students. The industry has also made a generous contribution towards the cost of the college and its equipment. The college is now in a better position to serve the industry than even before and it is hoped that full advantage will be taken of the greatly improved facilities.

A formal opening ceremony is being arranged and opportunities to view the college will be offered during the coming months.

Pig recording film

The Pig Industry Development Authority has produced a 16 mm. colour and sound film explaining the working of the pig recording scheme. The film which runs for 20 min. is intended for showing to farmers.

Sharples acquisitions

Sharples Centrifuges, Ltd., have recently purchased the German company Gesellschaft für Trenn und Trockentechnik m.b.H., who manufacture the *Contessor* conical screen centrifuge. The activities of this company will now continue as a division of Sharples.

With a view towards further expanding their centrifugal operations, Sharples have also purchased the centrifugal division of the Fletcher Works Incorporated, U.S.A. This will in future be known as the Fletcher division of Sharples.

Meat processing in Paisley

Paisley Co-operative Manufacturing Society, Ltd., has opened a £10,000 meat processing plant designed to operate as a central unit for 18 branch shops. The new plant will manufacture sausages, cooked meats, prepacked meats and other lines, and act as the central distribution and processing point for the society.

Pure Food Centenary—1960

To celebrate the centenary of the "Act for preventing the Adulteration of Articles of Food and Drink," a conference is to be held in London from September 20-23, 1960. Administrators, scientists and food manufacturers from home and overseas will be celebrating this Pure Food Centenary.

When this Act was passed in 1860 it was the first general pure food law to be made in any country and it was the forerunner of the pure food legislation in the Commonwealth, the U.S. and in most countries throughout the world. Since then has grown a new science of food technology and a tradition of good commercial practice has been established by food manufacturers which ensures that all food sold shall be clean and pure.

The proceedings will open with a Government reception given at Lancaster House on September 20 and during the conference, which will be held at the Royal Institution of Great Britain, meetings, lectures, an exhibition and laboratory visits will demonstrate the progress made in the past 100 years and show the part which the food chemist plays in improving the quality of food and providing better nutrition and better health.

Further details and registration forms may be obtained from the Secretariat, The Pure Food Centenary, 14, Belgrave Square, London, W.1.

Quick freezing at Stornoway

Moray Firth Foods, Ltd., are to establish a new quick freezing factory at Stornoway to freeze scampi. It is also planned to start a filleting and quick freezing unit at Stornoway to handle white fish for the national markets. In addition to this development the firm is to extend handling of venison for continental markets by exporting quick frozen venison packs.

New Clyde granary

The new granary which is now being constructed at the Meadowside Quay, Glasgow, will be one of the best grain-handling centres in Britain when it goes into operation next year.

The present equipment can unload 350 tons of grain an hour. Next year the figure will be increased by 1,200 tons. For nearly 50 years the Clyde Navigation Trust has provided a granary for the bulk handling of grain. Storage capacity will now be more than doubled. Three ships, instead of two, will be able to unload at the quayside simultaneously.

Sponge goods plant

The United Co-operative Baking Society, Ltd., Glasgow, has installed additional plant at their McNeil Street bakery to handle sponge goods on completely wrapped lines. The society plans to develop this field extensively, to meet demand in self-service units for sponge specialities.

Scottish prepacking plant

A produce prepacking plant has been established at the Queensway Industrial Estate, Glenrothes, Fife, by Mr. W. Thomson, an Aberdeen produce merchant. The plant is producing produce prepacks for the store trade and expansion of prepacking into other foods is planned. It is also intended to establish canning and allied services at the site.

Export handling at Wisbech

All Smedley's export orders, both for canned and quick-frozen foods, are now being handled centrally from their Wisbech factory. Formerly, orders were sent out from five factories throughout the country.

The new scheme, it is stated, will streamline the completion of export orders at all stages of handling.

Eskimo Foods—correction

In a news release published last month the telephone number of the new Eskimo London Sales Office was incorrect. The correct number is London Gulliver 4166 (5 lines).

Pre-Packed Flour Factory

Claimed to be the most modern plant in the country's pre-packed flour industry, the Feathery Flake factory of the Victoria Flour Co., Ltd., at Ashton Road, Bristol, was opened recently by Mr. Joseph McArthur Rank. They replace the Portland Square, Bristol, premises where Feathery Flake has been produced for the last 80 years. Three main buildings, the aluminium-clad factory, the office block and the garage and workshop, stand around a courtyard and the entire site covers about 68,000 sq. ft. Flour is delivered from the mills in 15 ton capacity lorries and blown to the 20 ton storage bins on the fourth floor. Other ingredients are stored on the fourth floor as well. The flour and other ingredients are measured on the third floor, mixed and sifted on the second floor, purified by Entoleter centrifuges and, finally, weighed and packed automatically on the ground floor.

New dried fruits package

The new minimum 30 lb. package introduced this year by the Australian Dried Fruits Board was recently displayed in London. The carton is being used experimentally this season for the first time.

Previously, the smallest size in dried fruit packs available to the trade has been either the 56 lb. or the 60 lb. wooden case; the smaller size has been introduced to facilitate easier handling.

The Australian Meat Board have introduced packs of Australian frozen boneless beef products. These included boneless crop, stripped loin and silverside in carton packs weighing about 60 lb.

Sorbitol production expansion

Howards of Ilford, Ltd., the only manufacturers of Sorbitol in the U.K., have decided to increase their production capacity for this material. A new unit is planned, and it should be on stream in a little over a year. It will give an additional capacity of 1,000 tons per annum of industrial humectant grade 70% syrup.

Home milled flour allocation

The National Board for Bakery Education says that the allocation of flour to all Technical Colleges providing classes of instruction in Bakery Subjects leading to the award of National Certificates has been renewed. It is given by the "Millers' Mutual Association," and the warmest thanks of the National Board for Bakery Education have been extended to that Association.

Ice cream sales h.q.

Sales headquarters of the South-Western division of T. Wall and Sons (Ice Cream), Ltd., have been moved into the Taunton area. Their new address is 37/8, Fore Street, Taunton.

The division manager is Mr. J. G. Vallance who took over at the beginning of the year when it was formed in accordance with Wall's recent reorganisation of its administrative areas. At 47, Mr. Vallance has been with Wall's for 25 years. He moved into his new position from Southampton, where he was divisional administration manager.

K. J. Daniells

T. R. Manderson

N. Parr

J. L. Caldwell

R. Carroll

P. Adams

PEOPLE

MR. KEITH J. DANIELLS has been appointed as a chemical engineer by Sharples Centrifuges, Ltd. He will be concerned mainly with the application of a wide range of separational equipment to the food and chemical industries.

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MR. L. E. MATHER, chairman of Mather and Platt, Ltd., is to retire from the board on March 31, 1960. MR. WILLIAM LORIS MATHER has accepted the board's invitation to take over the chairmanship.

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MR. DEREK E. MARCHANT, A.M.I. MECH.E., M.S.M.A., has been appointed as general sales manager of the D.C.A. Industries, Ltd., the British subsidiary of D.C.A. Food Industries Inc. of New York. He will hold overall executive sales responsibility for Bakery, Downyflake and Processor Divisions of the company.

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MR. L. F. PADGHAM has been appointed technical director for the southern area, MR. D. FRANCIS has been appointed technical director for the northern area and MR. G. W. J. PASQUALE has been appointed financial director and secretary to Edward Norman, Ltd., proprietors of the Norman Engineering Co.

•

MR. B. WILLIAMS has been appointed resident technical sales representative at the Bristol office of Crofts (Engineers), Ltd., in place of Mr. Dawson, who has left. Mr. Williams is apprentice trained and a graduate of the Institute of Engineering Designers. His experience has included ten years with a firm designing automatic packaging machinery, and he has recently undergone a period of training in power transmission equipment at Crofts head office and works.

He will represent the company in Hampshire, Dorset, Wiltshire, Somerset, Cornwall and Devon. His address is: 28, Queen Square, Bristol, 1.

MR. J. L. CALDWELL has been appointed a director of Reads, Ltd. He is chairman of the Merseyside branch of the Institution of Works Managers, deputy chairman of the board of governors of the Liverpool College of Commerce, a member of the council of the Institution of Works Managers, a member of the Merseyside branch council of the British Institute of Management and a member of the Business Management Advisory Committee to the Liverpool Education Authority.

•

MR. WILLIAM A. INNES, chairman of Cerebos, Ltd., and MR. REGINALD R. SEDDON, a director, have been co-opted to the boards of Sifta Salt, Ltd., and its subsidiary, Palmer, Mann and Co.

Cerebos recently made a successful offer for the ordinary shares of Sifta Salt.

•

Campbell's Soups, Ltd., have made several personnel changes in district No. 6 which covers London, East Anglia and the South.

MR. PETER ADAMS, who was district sales manager of district No. 6, becomes the U.K. sales manager, MR. NORMAN PARR, a retail sales supervisor, becomes district sales manager of sales district 3 in the North-West and MR. R. CARROLL, the present district sales manager of sales district 3, becomes district sales manager of sales district 6.

•

SIR RICHARD MANKTELOW, K.B.E., C.B., is retiring from the position of deputy secretary of the Ministry of Agriculture, Fisheries and Food in the New Year. He first joined the Department of Agriculture in 1914 and upon his return after the first world war served in a number of posts culminating in his appointment as deputy secretary in 1954.

MR. ERIC ROLL, C.B., C.M.G., who is completing his secondment to the International Sugar Council, will return at the end of the year as deputy secretary.

MR. G. S. BISHOP has been appointed a deputy secretary, filling the post left vacant since the retirement of Sir Edmond Harwood.

MR. T. R. MANDERSON has been appointed southern area manager for Benjamin Electric, Ltd. Sales manager at Allan Wingate (Publishers), Ltd., he joined the A.E.I. Lamp and Lighting Co., Ltd., in July, 1955, as lighting sales engineer in the architects and consultants specification section, and in due course was entirely responsible for this section.

Commissioned in the Royal Horse Guards, Mr. Manderson represented the British Army of the Rhine at lawn tennis and squash racquets, and is a past winner of the Junior Lawn Tennis Doubles Championship of Great Britain.

•

DR. F. H. BANFIELD, M.SC., F.R.I.C., F.R.S.H., M.I.BIOL., director of research of the B.F.M.I.R.A., has been appointed a governor of the National College of Food Technology with effect from July 30, 1959. The appointment was made by the Minister of Education on the nomination of the Institute of Meat.

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MR. B. D. GRAHAM has been appointed an additional director of H. J. Heinz Co. MR. F. B. CLIFFE has resigned from the board.

•

MR. K. W. SPRECKLEY has been made a director of British Oil and Cake Mills, Ltd. He succeeds the late Mr. E. D. Campbell as area manager of the Scottish and Northern Ireland branches of the company.

DR. S. B. COLES, technical director of the British Extracting Co., has been appointed vice-chairman in succession to Mr. Spreckley, who has left the board.

•

MR. ERNEST TAYLOR, deputy chairman of Unigate, Ltd., and chairman of Cow and Gate, Ltd., has been appointed chairman of Unigate, Ltd., for the ensuing year in place of the late Mr. Leonard Maggs.

MR. IVOR PRICE, chairman of United Dairies, Ltd., has been appointed deputy chairman and chairman of the executive committee of the board for the ensuing year.

Company Profits & Prospects

Heinz's increased sales

For the fourteenth successive year, H. J. Heinz Co., Ltd., increased their sales in this country. The volume of sales was up by 8% and the trading profits were hoisted by 3·3%.

Mr. H. J. Heinz, II, in his annual statement, reported that competitive pressures continued to increase and the company had, accordingly, increased its marketing and merchandising activities. Substantial initial operating expenses had been incurred with the commencement of production at Kitt Green, Lancs., but they were already benefiting from lower operating costs there due to new and improved processes.

The firm has, now that Kitt Green is in operation, started on a five year modernisation programme at their Harlesden factory.

The trading profit amounted to £4,234,892 and the net profit after taxation was £2,318,835.

Beecham interim raised

The interim dividend on the ordinary shares of the Beecham group for the year ending March 31, 1960, is 8%, less tax. During the previous year the first interim dividend was 7%, less tax.

Horlicks raise dividend

Horlicks, Ltd., have raised their final dividend from 12½% to 15% for the year ended March 31, 1959, making a total of 25% for the year (20%).

The group profit for the year amounted to £1,059,489 compared with £1,068,352, but after lower taxation the balance comes to £530,750 compared with £503,675.

Overseas company

J. H. Fenner and Co., Ltd., has announced the formation of Fenner Woodroffe and Co., Private Ltd., in Madras, in association with Gordon Woodroffe and Co. The new company will manufacture leather power transmission belting for distribution through the depots and agents of Messrs. J. H. Fenner and Co. (Overseas), Ltd., and Henry F. Cockill and Sons, Ltd., in India and certain markets in the East.

Cannery takeover

Foster Clark, Ltd., have acquired the entire issued ordinary share capital and over 97% of the preference share capital of Corbatch Canners, Ltd., of Swaffham, Norfolk.

Corbatch Canners, Ltd., will continue to pack and market under the Corbatch label, but will also utilise its production potential by packing for Foster Clark such fruits and vegetables as by reason of availability of crops can be packed more economically in Norfolk than in Kent.

Wall's Ice Cream Store

Among the first of the buildings to be completed at the site of the new ice cream factory being built for T. Wall and Sons (Ice Cream), Ltd., at Gloucester, is this depot, officially opened on October 1. The depot can keep as many as 600,000 portions of ice cream in store.

Schweppes's recent acquisitions

At the same time as the board of Schweppes, Ltd., made public the terms of the offer to acquire Wm. P. Hartley, Ltd., it was announced that the firm had bought all the ordinary capital and two of the three preference classes in Wm. Moorhouse and Sons, Ltd.

Mr. R. Hanning Phillips, chairman of Schweppes, reported an increase in their home group sales and profits for the first nine months of 1959 and forecast a final dividend of at least 15% on the capital increased by acquisitions making a total of at least 20% for the year against 15% equivalent previously.

The share exchange offer for Wm. P. Hartley involves more than £2 million worth of Schweppes shares while the price for the Moorhouse business works out at just over £1·6 million.

During the last few months, Schweppes have gained control of three jam and preserves firms, a new field for them, at a price of £3½ million. It is thought that long term economies of integration in the three businesses will make it possible to achieve an expansion of trade that will show a satisfactory return for Schweppes.

Chicken Information Council

Confusion in the housewive's mind over the term "broiler" is being ended by the formation of a Chicken Information Council, by the British Broiler Growers Association, the organisation representing chicken farmers.

The object of the Chicken Information Council is to help persuade British housewives to buy and eat more chicken.

Misunderstanding over the term "broiler," used to describe chicken reared under an intensive system originally adopted from America, has caused the creation of the Chicken Information Council.

Output of roasting chicken, or spring chicken, as broilers are better described, has increased fantastically since 1953, when production was negligible.

By 1957, 30,000,000 chicken were being produced annually, increased to 45 million last year. This year production is expected to top 70 million, worth between £25 to £30 million at over-the-counter prices.

Erections and Extensions

United Yeast Co., Ltd., are having a storage depot built at Midland Road, Lansamlet, Swansea, Wales.

•

Smith and Vosper, Ltd., are planning to extend their bakery at Green Road, Portsmouth, Hampshire.

•

Rowntree and Co., Ltd., are having an extension built to their existing cream block department at their York factory.

City Mineral Water Co., Ltd., are having a factory built on a site at the junction of Bradman Road and Hammond Road, Kirkby Industrial Estate, Liverpool.

•

Scotch Bakery (Sussex), Ltd., Green Street, Eastbourne, Sussex, are planning to have a 20,000 sq. ft. bakery and distribution depot erected on the Brampton Road Trading Estate, Eastbourne.

OBITER DICTA

● The lid has definitely come off aluminium as a canning material. —*Aluminium News.*

● Surely it requires no more "service" to bring me a bottle of wine than a bottle of beer; so why should I pay 10 times as much for the same job?—*Letter in Daily Telegraph.*

● Now that the sentries at Buckingham Palace will be behind bars, will the public be allowed to feed them with buns on the end of umbrellas?—*Letter in Daily Express.*

● Repercussions of gas chromatographic work on alcoholic beverages: A Mexican company asked for samples of whisky extract. Intention: To make a soft drink with whisky flavour.—*Chemical and Engineering News.*

● Americans chewed their way through 250 million lb. of chewing gum last year. This represents more than 200 sticks per person, or, if you like to think big, a single stick 1·5 million miles long. —*Chemical and Engineering News.*

● I predict that any girl who can make a steak-and-kidney pudding with a golden crust, tender meat, plenty of rich, dark gravy, a hint of mushrooms and a whisper of herbs will receive six proposals of marriage in 1960. —*Anne Scott-James, Daily Express.*

● When staying at a northern hotel recently, I was amused to find the following items on the menu: Angels on Horseback . . . 5s.; Devils on Horseback . . . 4s.; and I reflected that, like the late Earl of Beaconsfield, the management must be on the side of the angels.—*Letter in Daily Telegraph.*

● Mr. Kruschev told how he had stopped a woman who was walking in the street and asked how things were with her. He got the reply, "We are glad of the good fortune in meeting you. Footwear, fabric, milk and many other goods have been rushed to the shops for your visit. Come and see us more often." He said, "This is no way of doing things, comrades. One must see to it that these towns receive an adequate supply of food. It is senseless to supply people on the coast with tinned fish. It is also time to provide enough for the population.—*Moscow Radio.*

Baking Research Association's successful year

"It has become clear that future development at Chorleywood will be handicapped by lack of adequate laboratory facilities and the provision of a second wing is under urgent consideration" says the report of the Council of the British Baking Industries Research Association for the year ending June 30, 1959.

The Association's annual general meeting was held at the Trocadero Restaurant, London, W.1, on October 29, and was presided over by Dr. R. T. Colgate, who was authorised, by a special resolution, to continue in office as a Member of the Council, having reached the age of 70.

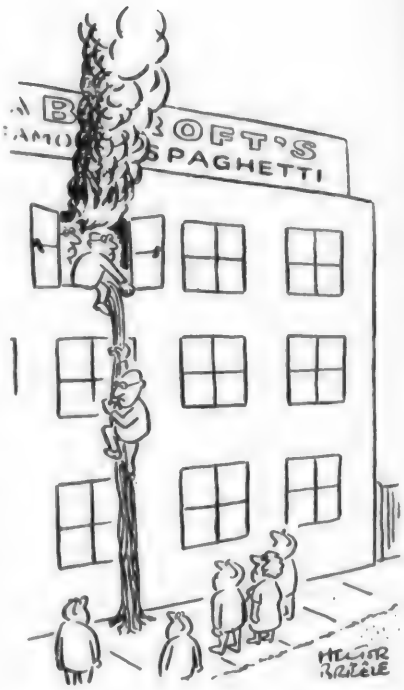
Dr. G. A. H. Elton, Director of Research, reported that "very satisfactory progress" had been made on the six major long-term investigations being carried out, and that useful developments are beginning to arise. He said that new building extensions should be finished some time next year.

The treasurer stated that the income for the year, £66,940, was the highest on record and was due in part to the satisfactory increase in the number of members, which at 1,400 is the highest in the Association's history. A statement, by the chairman of the Membership Committee, that this represents only 7% of the possible membership if all the bakers in the country joined the Association is rather misleading, as the membership does in fact account for something like 90% of the country's production, which was not mentioned at the meeting. Most of the leading firms in the industry have been very loyal supporters of the Association from its inception, and the main campaign during the year has been concentrated on the large number of small businesses which are still not members. It was pointed out that membership can be obtained for as little as 1s. 2d. per week.

Additional funds have been offered by the D.S.I.R. for the period ending March 31, 1964, and with these funds a greatly improved scientific liaison service, certain work on the production engineering side and a mobile laboratory could be provided.

In the technical session which followed the meeting, Mr. Wright of the Association's staff described work carried out to determine the diastatic activity of a flour by a better method than measuring the maltose figure, which is unreliable; and Dr. Elton in a general talk on the present and future work of the Association, said that there have been extremely few problems submitted to them which had not been at least partially solved. He exhorted members to submit their problems, and every help would be given.

The sessions were followed by a luncheon at which the chief guest was Dr. H. R. Barnell of the Ministry of Agriculture, Fisheries and Food.



Overseas Enquiries

Western Germany: Foodstuffs

Importhaus Wilms and George G.m.b.H., Platterstr. 114, Wiesbaden, wish to get into touch with U.K. exporters of corned beef, tinned meats and vegetables as well as jams in tins and jars.

Interested exporters should write direct to the Wiesbaden firm. At the same time, they should notify the British Consulate-General, Commercial Section, 47, Zeppelin Allee, Frankfurt am Main, that they have done so.

Wolfgang Lorenz, Oldenburg (Oldb), Falklandstr. 5, are interested in establishing business relations with U.K. exporters of: china horse beans (broad and small), and tapioka-, manioka- and cassava flour, maize flour and other liberalised feedingstuffs.

Interested exporters should write direct to the German firm. At the same time, they should notify the British Consulate, Commercial Section, Bremen, Am Wall 102, that they have done so.

Both firms are considered to be suitable connections.

All books reviewed in FOOD MANUFACTURE as well as any other scientific or technical book may be obtained from:
Technical Books
308, Euston Road
London, N.W.1.
Tel: Euston 5911.
Prompt attention is given to all orders.

Food News Overseas

Haitian chocolate plant

A concession has been granted by the Haitian Government to the Haitian Manufacturing and Specialty Co., whereby this firm acquired the exclusive right to install in Hayti a factory to process cocoa. Work on the plant, which will cost $300,000 and will be located on Avenue Roosevelt, Port-au-Prince, has started. It will produce chocolate in 10 lb. blocks, but it plans to manufacture several types of chocolate products in the future.

Vegetable oil industry

The groundnut processing industry in the Dominican Republic carried on by the firm of Sociedad Industrial Dominicana is to be further enlarged. New equipment costing $1·2 million will enable the production of cattle food to be commenced and also in another section of the factory the extraction of oil from cotton seed. There will be a daily processing figure of 100 tons of cotton seed. The company's campaign to encourage farmers to experiment with groundnut crops has been so successful that production has risen from 35,000 tons to 65,000 tons in six years.

U.S. powdered foods

A new process which has been used to make powders of good colour and flavour from fruit juices, whole and non-fat milk, coffee, beef and chicken broth, and lemonade has been reported from the U.S. Called "foam-mat" drying, the new process involves whipping liquid food concentrates into a foam with the assistance of food additives, spreading the foam out on a belt or tray, and drying it in a stream of warm air. Finally, the foam is compressed and crushed into powder form.

The fine structure of the foam created in the process is said to remain stable, despite even compressing the powder into pellets, and the powder may be readily reconstituted with water. Another advantage of the foam-dried powders is that they hold less moisture at a given relative humidity than do spray-dried foods and are therefore less liable to cake than powders dried by other processes.

The additive used to develop a satisfactory foam amounts to about 1% of the dry solids in the liquid food concentrate being whipped, and close control of the density can be provided by careful adjustment of the quantity of additive and the amount of whipping.

Natal and Zululand sugar industries

The total value of the sugar industry in Natal and Zululand is now £113 million, according to a recent report by the Doornkop Sugar and food Industries, South Africa. A survey of all sugar mills at present operating indicated that the combined replacement value of assets exceeded £43 million, and that the value of the land and cane crop today is about £70 million.

Asian food technology seminar

Speaking at a food technology seminar held at the Central Food Technological Research Institute at Mysore, India, in August, the then Indian Minister for Food and Agriculture, Shri Ajit Prasad Jain, spoke about the urgent food and nutrition problems of the region which now contains more than half of the world's population. He laid particular emphasis on the inadequacy of the diets consumed by a large section of the people of the region and the need for planned development of nourishing foods from the materials at hand or materials which could be produced in the region.

Papers, reports and other contributions were made by the delegates from other countries.

Protein food for Nigeria

A new protein food for fighting malnutrition is now being produced on a large scale in Nigeria by a Glaxo Laboratories (Nigeria), a recently formed subsidiary of Glaxo Laboratories, Ltd. The food itself, which is called *Amama*, was developed at their Middlesex laboratories as a result of four years' research. The product is now being made at a new Glaxo factory at Apapa, the Lagos industrial suburb, and it is being marketed by R. E. Harding and Co., of Lagos, and Standard City Chemists, Ibadan.

The food is in powder form, pink in colour, and consists largely of groundnut flour to which carefully calculated proportions of dried yeast, milk casein, sugar, minerals and vitamins have been added. An 8 oz. pack, enough for 8 days, costs about 1s. 6d.

Nigerian health specialists are hoping that the child death rate from protein malnutrition can be cut substantially once the population becomes aware of the possibilities of the food. An extensional education campaign is being used.

South African canning difficulties

Many canning concerns in South Africa are reported to have gone out of business during the past year and the industry is facing a difficult time. There is severe competition among the canners to buy fruit from the farmers, with a consequent rise in the price of fruit, and there is intense rivalry for the U.K. market.

The U.S. cans only the finest quality peaches and it is therefore logical that their overheads will be lower than those of South African canners who will have to handle several grades of fruit in the country's estimated 45,000 ton crop this season. To add to the difficulties the South African farmers are paid £10 per ton more than their U.S counterparts.

Colombian biscuit plant

The International Finance Corporation has announced details of its U.S. $1 million investment in Fábrica de Galletas y Confites Noel S.A., of Medellin, Colombia. The company is completing the installation of a modern air-conditioned plant that should progressively increase production by about 50% to 12,000 tons of biscuits and similar products per annum.

Flour mill for Nicaragua?

Technicians of the INFONAC, Nicaragua, have been studying the possibilities of reopening a flour mill in Masaya, which has been idle for over 20 years. It would have a production capacity of 20,000 quintals of flour per annum.

Swedish chocolate plant

A. B. Marabou, Swedish producers of chocolate, confectionery and canned goods, are to invest Kr. 18 million over the next three years in extending their plant at Bjuv, Sweden.

The investment will be used for increasing the output of frozen vegetables and poultry at the Findus division. A new laboratory is also being built at a cost of Kr. 3·5 million. It is scheduled for completion at the end of 1960.

Findus estimate that they will produce some 30,000 tons of frozen foods valued at £7¼ million this year, more than £1·3 million worth being exported. It is hoped to increase the figure for exports considerably in the next 5-10 years.

Packaging

Under-surface printing

Latest additions to the range of printed self-adhesive tapes made by John Gosheron and Co., Ltd., include tapes which are printed by the new under-surface technique. The print appears between the film of the tape and the adhesive, giving a sharp, colourful image protected against abrasion. Under-surface printed cellulose tape (5 Star-Transoprint) is intended for general packaging; under-surface printed vinyl tape (5-Star Vinylprint) has been developed for waterproof packing and labelling requirements. Another variation of this tape has a special " trial C " adhesive, which was specially developed for carton sealing on automatic taping machinery. The full range of printed tapes also include standard cellulose and vinyl tapes, two-ply tapes, acetate, ethyl cellulose, paper, cloth and waterproof cloth tapes and labelling tapes with a " write-on " surface.

Poultry bags

The Oppenheimer Casing Co. (U.K.), Ltd., have introduced *Hypak* standard printed polythene bags for table poultry. The bags are available in two sizes—10 in. × 15 in. and 12 in. × 15 in.

Boilable meal packs

The packaging of cooked meals which can be kept in deep freeze until required, and re-heated by immersing the entire pack in boiling water, is now being carried out by the use of film made from *Rigidex* high density polyethylene, made by British Resin Products, Ltd.

Only 5-15 min. is required to re-heat the pack in boiling water, and no pans or utensils are soiled.

The boilable pack is stated to be ideal for a wide variety of foods, and as all natural oils, gravy, sauces, etc., are retained within the pack, no flavour is lost and there is no likelihood of dilution or contamination.

Rigidex blown film is described as ideally suited for the manufacture of boilable bags, as it has the best all-round properties of the polyethylene available commercially. It has a high melting point, good grease and oil resistance and low permeability to liquids and gases. The film is tough and tear resistant. According to the makers, it retains its mechanical properties at very low temperatures, which enables it to withstand any degree of commercial refrigeration.

Shown here are the Christmas gift tins which are being marketed by Meredith and Drew this year. The pack at the top, left, is called Elizabethan while on the right is a pack called Roses. In the middle is a child study called Kathleen, with, on the right, Wedgwood Blue and, bottom, Festival. All the packs contain a Christmas assortment of sweet and chocolate biscuits.

Laminated packs

The Metal Box Co., Ltd., recently demonstrated an improved method of laminating foil and polythene, developed by the Plastics Group.

The properties of foil and polythene have long been recognised in the packaging field and in a suitable combination provide a high degree of protection, together with good machine handling characteristics and strong seals. However, there has been a tendency to produce material of noticeable odour, which can be imparted to sensitive products. The Metal Box method, employing a special laminating technique, produces a material with no polythene odour, thus offering distinct advantages particularly to packers of foods and sugar confectionery.

A boilable pack made in "Rigidex" blown film which can be immersed in boiling water.

Laminated foil and polythene will withstand long periods of immersion in boiling water and has a definite application to the boil-in-the-pack technique of marketing foodstuffs.

Foil and polythene is available in the form of plain or printed reels and pockets. Where necessary, additional materials (paper, glassine, cellulose acetate) can be bonded to the outside, thus providing additional rigidity and, in the case of transparent materials, permitting reverse printing to be employed.

High density polythene film

Metal Box have announced that *Densothene*, a grade of polythene film in the high density range, is now available.

Of major interest at present to food packers is the fact that prepared foods can be cooked by boiling in a bag made from this material.

Compared with low density (or conventional) polythene film, high density polythene film is claimed to have: greater rigidity; lower permeability to gases and moisture vapour; greater resistance to oils and fats; a higher sealing temperature; less transparency and; a lower tear-resistance.

The film will enable packs of special dishes to be prepared centrally under the supervision of chefs, stored under deep-freeze conditions by the caterer and served on demand by any catering establishment in no longer time than it takes to heat in boiling water.

It is stated that many of the early applications in the boilable pack field will use *Densothene* bags inside a printed carton.

More rigid than the conventional low density polythene, Metal Box expect that *Densothene* will hasten the use of polythene film for machine overwrapping and other automatic operations.

The film is available in the form of bags, layflat tubular reels and in reels of sheeting, either plain or printed.

New Companies

Animal Fare, Ltd. (633979.) 5, King Square, Bridgwater. Mnfrs. of and dlrs. in animal foodstuffs, etc. £100. Dirs.: F. N. Turner and H. J. Lederman.

Charles Beddard, Ltd. (633490.) 4 and 5, Mardol, Shrewsbury. To take over the bus. of bacon curers carried on at Shrewsbury as "Charles Beddard," etc. £2,000. Dirs.: Percy V. Wheeler, Edith and Agnes M. Beddard.

Facchino, Ltd. (633716.) Reddicap Trading Estate, Sutton Coldfield, Warwicks. Mnfrs. of and dlrs. in cakes, biscuits, chocolate and chocolate confectionery, etc. £10,000. Dirs.: Anthony W., and Terence C. H. Facchino.

Fairdeal Foods, Ltd. (631810.) The Stores, Hilton, Bridgnorth, Salop. Mnfrs. of and dlrs. in prepacked frozen foodstuffs, etc. £500. Dirs.: Wm. F. Stocking and Carol A. Little.

Fro-Lon, Ltd. (632013.) 28, Monument Street, London, E.C.3. Mnfrs. of and dlrs. in and canners and bottlers of jams, preserves, syrups, etc. £100. F. M. Roberts and K. J. Foskett.

Lacks Confectioners, Ltd. (634572.) 11-12, Neeld Parade, Wembley Hill Road, Wembley, Mdx. £2,000. Dirs.: Leslie and Teresa Jacks.

Latham Foods, Ltd. (632600.) Port Causeway, Bromborough, Ches. To take over the bus. of mnfrs. of and dlrs. in breakfast cereals and cake mixes and other food products carried on at Bromborough, Ches., and other places by Latham and Co., Ltd. £300,000. Dirs.: John E. Latham, John A. Brocklehurst and H. S. Staveley.

Lewis and Co. (Woburn Sands), Ltd. (634693.) 1, Russell Street, Woburn Sands, Bletchley, Bucks. Bakers and confectioners, etc. £500. Dirs.: George and Rose S. Gray.

Maynards Bakeries, Ltd. (633724.) The Bakery, Wood Street, Taunton, Som. £100. Dirs.: Wm. R. and Gerald F. Maynard, and John L. Jeffree.

North Western Meats, Ltd. (636270.) 6, Kirkstone Road North, Liverpool, 21. To take over the businesses of retail butchers, including retailing of groceries, provisions, etc., together with that of mnfrs. of and distributors of cooked meats and table delicacies now carried on by "Rawlinsons" of 70, Baycliffe Road, Huyton, Lancs.; and further to acquire from Rawlinsons the motor vehicles, and shop fittings, etc., installed in said premises. £100. Dirs.: Leonard and Elspeth Callaghan.

Orchard Pak Co., Ltd. (636857.) To carry on the bus. of growers, cultivators, packers, freezers and canners of and dlrs. in potatoes, watercress, fruit, vegetables, etc. £10,000. Subs.: T. O. Williams, The Orchards, Barton Road, Wrawby, Brigg, Lincs., and F. Coleman.

H. Raymond and Sons, Ltd. (635149.) 81, Boutport Street, Barnstaple. To take over the bus. of bakers and confectioners carried on as "H. Raymond and Son" at Boutport Street and High Street, Barnstaple, etc. Dirs.: Horace, R. F. and Mrs. R. Raymond.

These particulars of new companies recently registered have been extracted from the daily register of Jordan and Sons, Ltd., Company Registration Agents, 116, Chancery Lane, London, W.C.2.

Trade Marks

HI-GLOW.—784,777. Canned, preserved, dried and cooked fruits and vegetables; and jellies (for food) and jams. **Gollin and Co., Ltd.,** Plantation House, Mincing Lane, London, E.C.3.

VEREDALE.—786,441. All goods included in Class 29. **Debenhams, Ltd.,** 91, Wimpole Street, London, W.1.

SOUTHERN CHOICE.—786535. All goods included in Class 29. **J. Gerber and Co., Ltd.,** St. George's House, 193-7, Regent Street, London, W.1.

BACAJOINT.—786,543. Bacon. **William Kingham and Sons, Ltd.,** Queen's Wharf, Reading.

CARNATION.—786,573. Bacon. **John Martin of London, Ltd.,** 14, Seething Lane, London, E.C.3.

TOR DALE.—787,293. Poultry, not live. **Hypak Poultry, Ltd.,** 100-103, Stover Camp, Newton Abbot, Devon.

GOLDEN CHIEF.—787,749. All goods included in Class 29. **Co-operative Wholesale Society, Ltd.,** 1, Balloon Street, Manchester.

GRANDULAR.—787,846. Canned meats. **Sheed, Thomson and Co., Ltd.,** Hibernia Chambers, London Bridge, London, S.E.1.

POPPLES.—774,833. Non-medicated sugar confectionery and chocolates. **Robertson and Woodcock, Ltd.,** Trebor House, Woodford Green, Essex.

FUZZY WUZZY.—782,453. Coffee, tea, cocoa, sugar, rice, tapioca, sago, mixtures of coffee and chickory, dandelions, cereals and yeast for use as coffee substitutes; flour, cereal preparations for food for human consumption; bread, biscuits (other than biscuits for animals), cakes, pastry, non-medicated confectionery, ices; honey, treacle, edible yeast, baking powder; salt, mustard, vinegar, pepper, sauces, spices (other than poultry spice); and ice. **Exquisite Food Products Co., Ltd.,** 3, Lovat Lane, London, E.C.2.

GOLDENSHEAF.—B783,746. Self-raising flour, sweetened flour for use in making cakes, preparations made from cereals included in Class 30 for producing a batter mixture for frying and custard powder. **S. H. Phillips and Co., Ltd.,** 109, Grosvenor Road, Birmingham, 20.

DAD'S COOKIES.—786,772. Biscuits (other than biscuits for animals). **Dad's Cookies, Ltd.,** Shirley Works, Park Royal Road, London, N.W.10.

BROMPTIES.—787,296. Non-medicated confectionery. **Ernest Jackson and Co., Ltd.,** Arcadian Works, Union Road, Crediton, Devon.

BLENDCEA.—787,766. All goods included in Class 30. **Procea Products, Ltd.,** 16, Curzon Street, London, W.1.

KRAFT.—B775,960. All goods included in Class 29, but not including table jellies or any goods of the same description as table jellies. **Kraft Foods, Ltd.,** Morris House, Berkeley Square, London, W.1.

RELLI.—785,780. Processed vegetables included in Class 29. **Harold John Davey,** 2, Doughty Street, London, W.C.1.

MUNTONA.—768,584. Malt flour. **Munton and Fison, Ltd.,** Cedars Factory, Stowmarket, Suffolk.

New patents are from the Journal of Patents and new trade marks are from the Trade Marks Journal. In each case permission to publish has been given by the Controller of Her Majesty's Stationery Office. Each of the publications is obtainable from the Patents Office, 25, Southampton Buildings, London, W.C.2.

COMPANY MEETING

SCRIBBANS-KEMP

Current Trading Impovement

The 32nd annual general meeting of Scribbans-Kemp, Ltd., was held on October 12 in London, Mr. H. Oliver-King (chairman) presiding.

In his circulated statement the chairman said that the profit for the year was £416,923, as against £830,938, the fall being due largely to special circumstances and items of a non-recurring nature. Group turnover had reached the record figure of over £20 million and had been achieved despite fierce competition and the downward trend in prices to the public. Overall exports, which showed a healthy increase of 19%, appeared to be steadily mounting.

Referring to the considerable reorganisation in the Biscuit Division, the chairman stated that examination had revealed that the public was absorbing, and was willing to absorb increasingly, the speciality products made by the company although there was difficulty in disposing of large quantities of ordinary biscuits. As a result, the organisation was concentrating progressively on specialities, with increasing success.

The question of dividend was difficult but, bearing in mind the higher current profit earning and strong reserve position of the company, the Board recommended a final dividend of 5%. An interim dividend of 5% would be paid in March and a progress report would be issued to the Shareholders at the same time.

The Company has been undergoing a somewhat difficult period with a sharp drop in profits but the root difficulty appears to have been overcome and recovery is equally sharp. I have no doubt that in the near future the Company will be able to resume its policy of expansion.

Addressing the meeting the chairman said: "The profit made to date is approximately the same as for the whole of last year but of course you will not expect me to anticipate the year's results. However, at the moment the improvement continues and is accelerating."

The report was adopted and the total distribution of 10% approved.

Recent Patents

COMPLETE SPECIFICATIONS ACCEPTED

822,614. GENERAL FOODS CORPORATION: Fat compositions and preparation thereof.
822,728. C. PFIZER AND CO., INC.: Vitamin products and method of preparing same.
822,758. GOODYEAR TYRE AND RUBBER CO.: Packaging red meats.
822,786. ABBCO BREAD AND CO. PTY., LTD.: Cover means for swing tray ovens and the like.
823,399. CALIFORNIA AND HAIWAIIAN SUGAR REFINING CORPORATION, LTD.: Fondant and dry fondant sugar product and method of manufacture.
823,400. ECREMEUSES MELOTTE S.A.: Method of and apparatus for bottling milk.
823,536. ATELIERS DE CONSTRUCTION GUILLAUME IOMS SOC.: Tunnel-type ovens having radiant heating elements and a method of baking therein.
823,545. J. C. DE VASCONGLAS: Process for extracting oil from cashew nuts and apparatus for carrying this out.

ABSTRACTS OF BRITISH PATENTS

Crisp foodstuff

A process is claimed for producing a dry material which can be fried into a crisp foodstuff. The process comprises mixing a dry mainly starch-containing powder with such an amount of water as is required to obtain a mixture having a moisture content of 30-40% by weight; this mixture is then extruded under a pressure of at least 6 atmospheres to form a coherent ribbon, which is subsequently dried either in separate pieces or cut in lengths to a moisture content of 6-10%, preferably 8-9%.

The starch-containing powder can, for example, be potato powder.—822,018. *Nibbit Products Association, Ltd.*

Heating apparatus for food

A heating apparatus for food comprises a hollow base with upwardly pointing supporting elements which contain heating elements, which have at least one longitudinal cutting edge, and which are mounted at adjacent positions on the base to receive impaled thereon a food casing such as a bread roll for heated meat, a sausage or the like.

Thermostatically controlled electric windings are contained in the hollow base.—822,286. *E. J. Forbat.*

Dry pulverulent matter

Describes a process for the manufacture of a dry pulverulent nutritious matter which comprises dispersing pulverised liver in an aqueous solution of a jellifiable colloid and a mono- or di-saccharide, and finally working up the dispersion into dry small solid particles.

In a preferred process, the aqueous dispersion has a comparatively high content of the jellifiable colloid, and is sprayed into an oil which does not mix with the dispersion and which is at a temperature below that of the dispersion, with the result that solid particles are formed which are subsequently dried. This drying can advantageously be carried out by extraction with a water-extracting solvent.

An antioxidant such as 2,2'-methylene-bis-4-methyl-6-t-butyl phenol may be incorporated into the aqueous liquid.—822,038. *N.V. Philips' Gloeilampen Fabrik.*

Technical Press Review

November

Dairy Engineering. — Sterilised Milk: Terminal or End Process Heating in Bottles; The Microscope for Dairy Chemists; Aseptic Canning of Dairy Products; Laboratory Equipment and Furnishings.

World Crops.—Agricultural Aviation Demonstration Report; Fifty Years of Aerial Farming; Crop Protection by Seed Treatment; Plant Nematodes.

Manufacturing Chemist.—Safety: Safety in the Chemical Industry; Safety Equipment Review; Riker Laboratories' New Factory; General Organic Unit; Electronic Techniques in Pharmacology; Progress Reports: Disinfectants and Disinfection; Detergents and Detergency.

Petroleum.—Whitegate Refinery: Ireland's First; French Saharan Developments; Ravenna Petrochemical Plant; Gas-Solids Contacting in Fluidised Beds; Oilfield Development—5.

Paint Manufacture.—Shapes and Properties of Polymer Molecules; Rafelite; Anticorrosive Properties of Red Lead Pigments; Aluminium Complexes in Paints—2.

Automation Progress.—Automatic Testing and Sorting of Welded Tubing; Transistor Mag.-Amp Arrangement for High Speed Servo Drive; Programme Controlled Machine for Knitted Garments; Some Economic Aspects of Automation; Wanted—an Educational Policy for Automation; Machine Tool Control System.

For specimen copies write to Leonard Hill House, Eden Street, London, N.W.2.

Fruit cake mixes

During the preparation of fruit cake mixes, difficulties have been experienced due to the formation of dough during the preliminary mixing of the fat and flour. This difficulty is overcome in this invention by forming a fruit cake mix containing dried fruit, flour, sugar and other ingredients in which the fat is provided in the form of a coating on the fruit.

If desired, all or part of the sugar is included in the fat coating and, in this case, the fat and the sugar are creamed together before their application to the fruit. This application is suitably effected by spraying the creamed fat and sugar in a molten state on to the fruit.—822,062. *Alfred Bird and Sons, Ltd.*

Dressing fish

A method of dressing fish is claimed, which method comprises putting the fish into a holder having walls beneath and behind the fish; pushing the fish through the holder to introduce the snout into a guide which lies outside of and parallel to the path of the holder, which admits the snout only up to the eyes, and which supports the snout from below; cutting through the fish between the holder and the guide while supporting the fish behind the snout; and varying the position of this cut in accordance with the thickness of the fish.

An apparatus suitable for dressing several fish is also claimed; this apparatus comprises a series of holders from which the heads of the fish project into the path of a rotary cutting blade. Various modifications such as suitable means for adjusting the knife relative to the guide are also described.—822,263. *R. G. T. Baader.*

Dressing fish

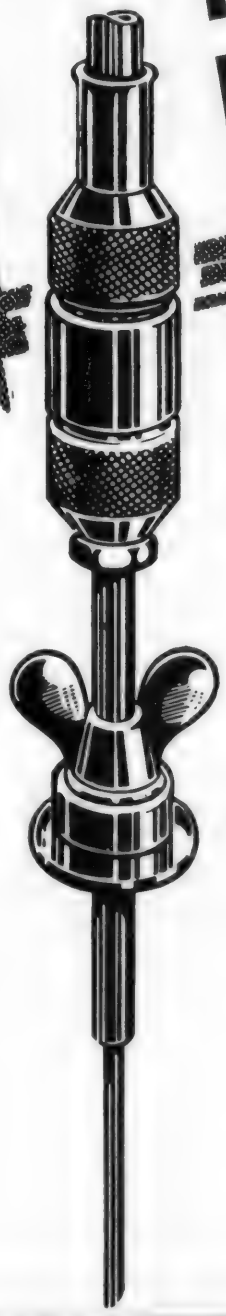
Apparatus is described for supplying fish to a fish-dressing machine, which apparatus comprises a series of open-mouthed fish holders mounted to move in a closed path which includes a downward run during which each fish falls out of the holder under the action of gravity, a receiving means into which each fish falls, means for conveying the fish from the receiving device in a transverse direction to that of the movement of the holders, and means for retarding the movement of one end of each fish out of its holder to ensure that the fish falls into the receiving device with its opposite end leading.

In one of the modifications which are described, the retarding means comprises a part of the wall of the holder shaped to fit round the end of the fish.—822,264. *R. G. T. Baader.*

Abstracts of British patents have been taken from published specifications by permission of the Controller, H.M. Stationery Offices. The full specifications are available from: The Patent Office, 26, Southampton Buildings, London, W.C.2. Price 3s. 6d.

HEAT PENETRATION

of canned foods in an autoclave



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(B)

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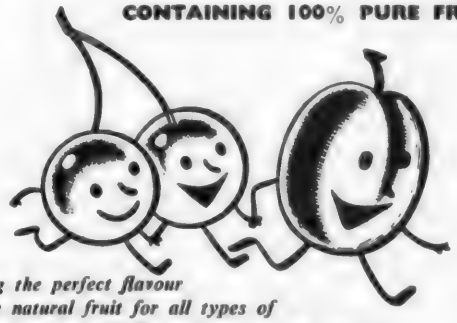

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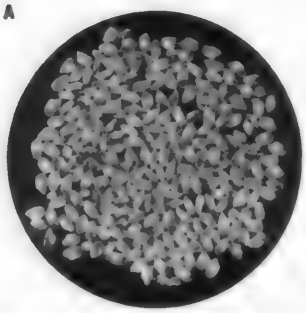

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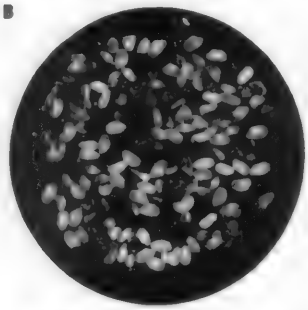

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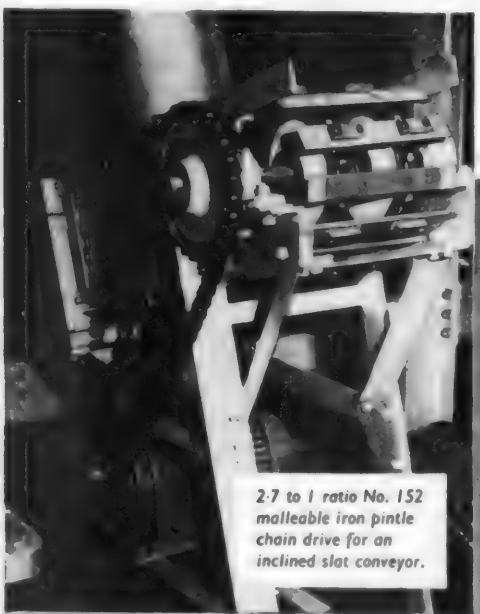

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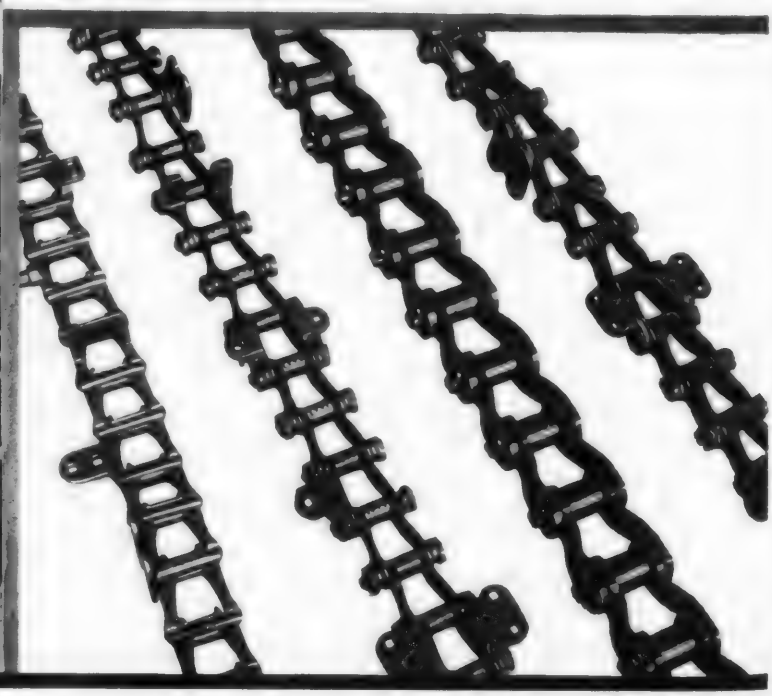

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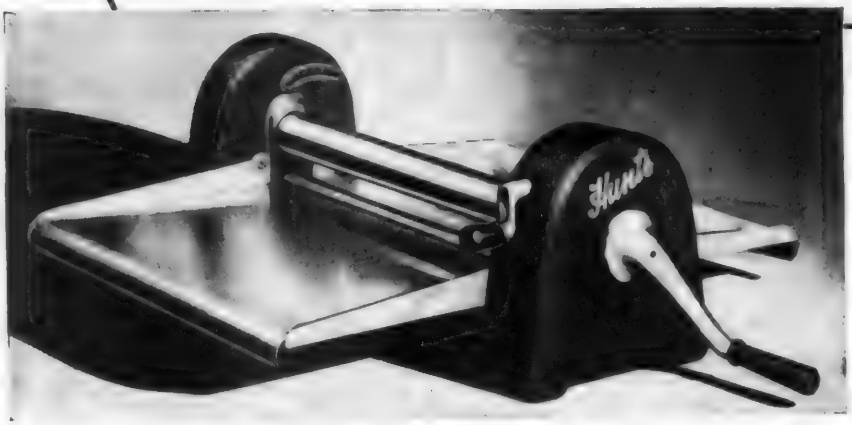

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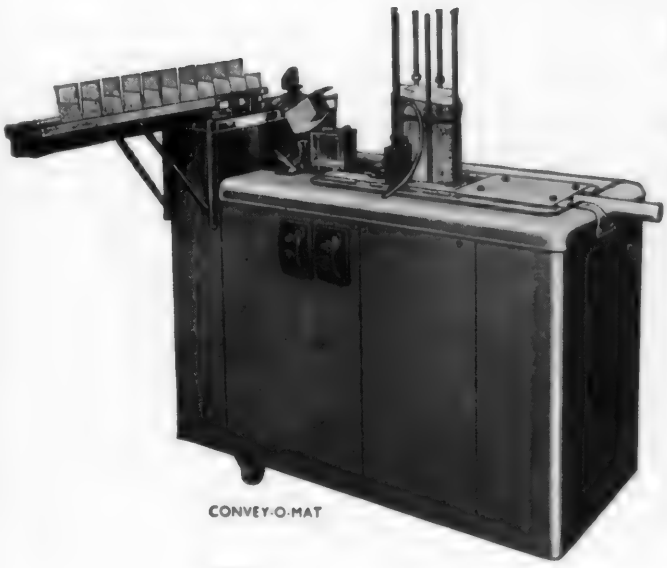

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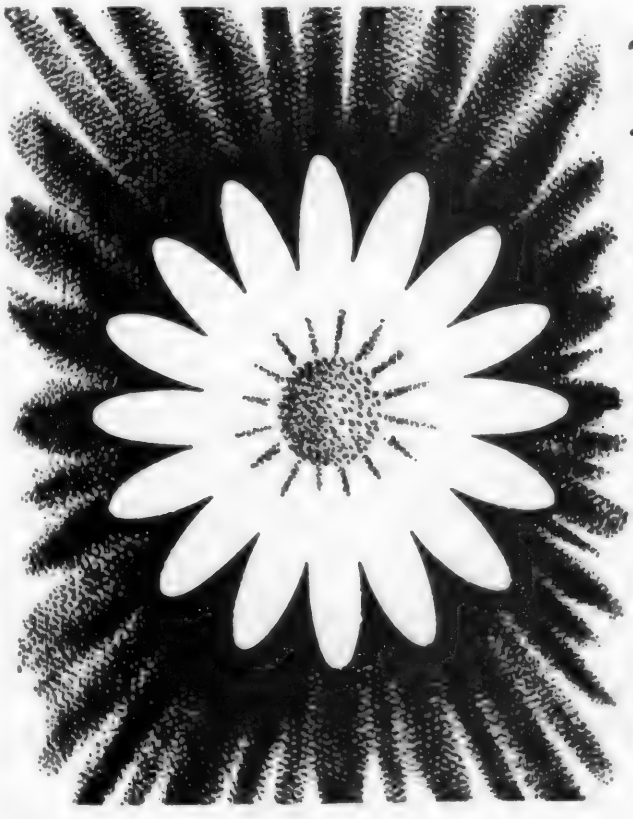

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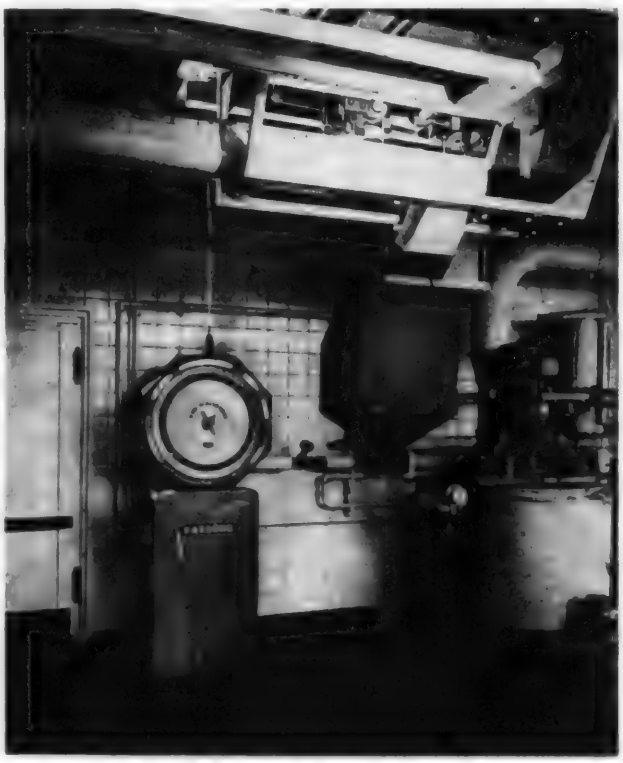

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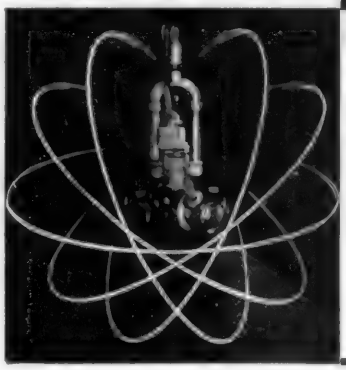

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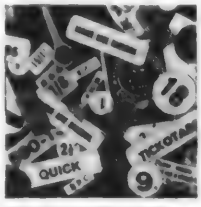

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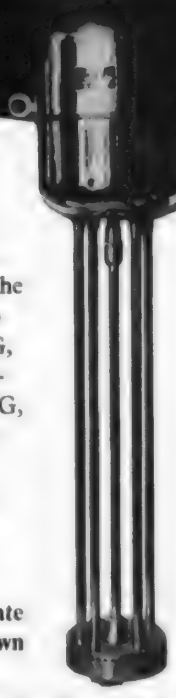

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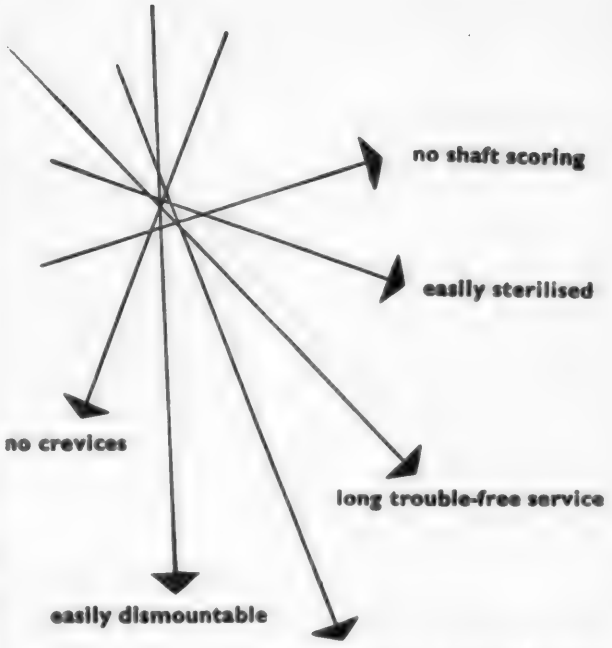

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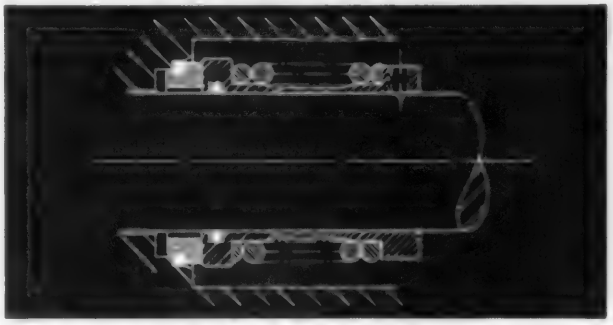

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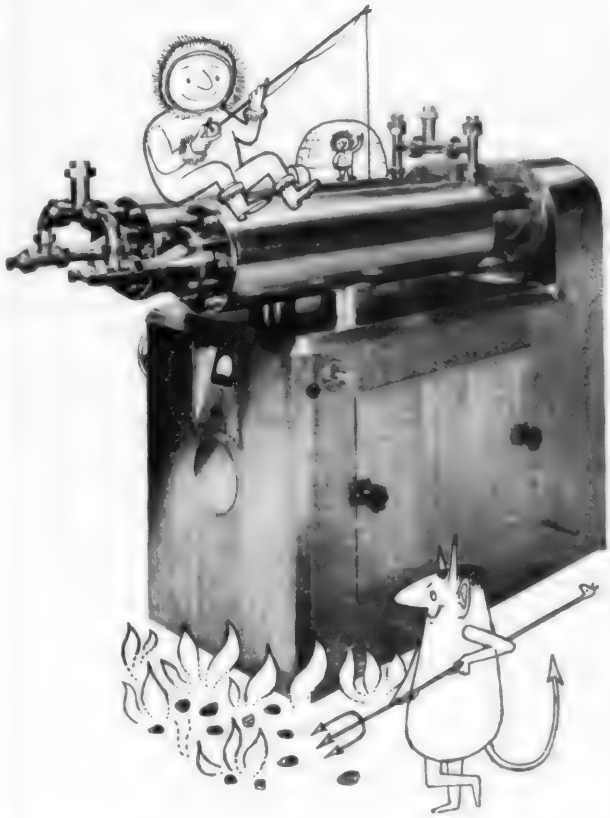

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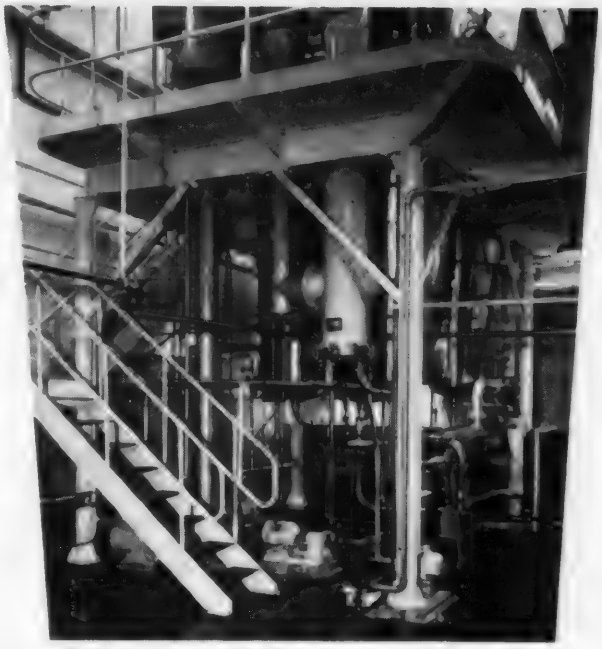

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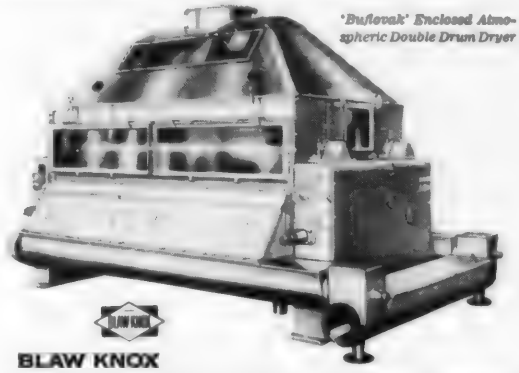

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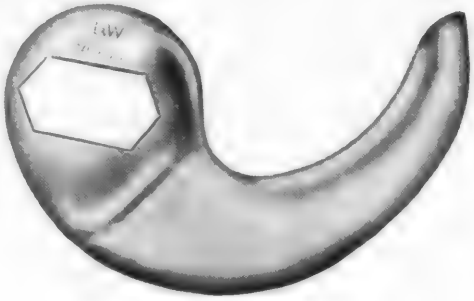

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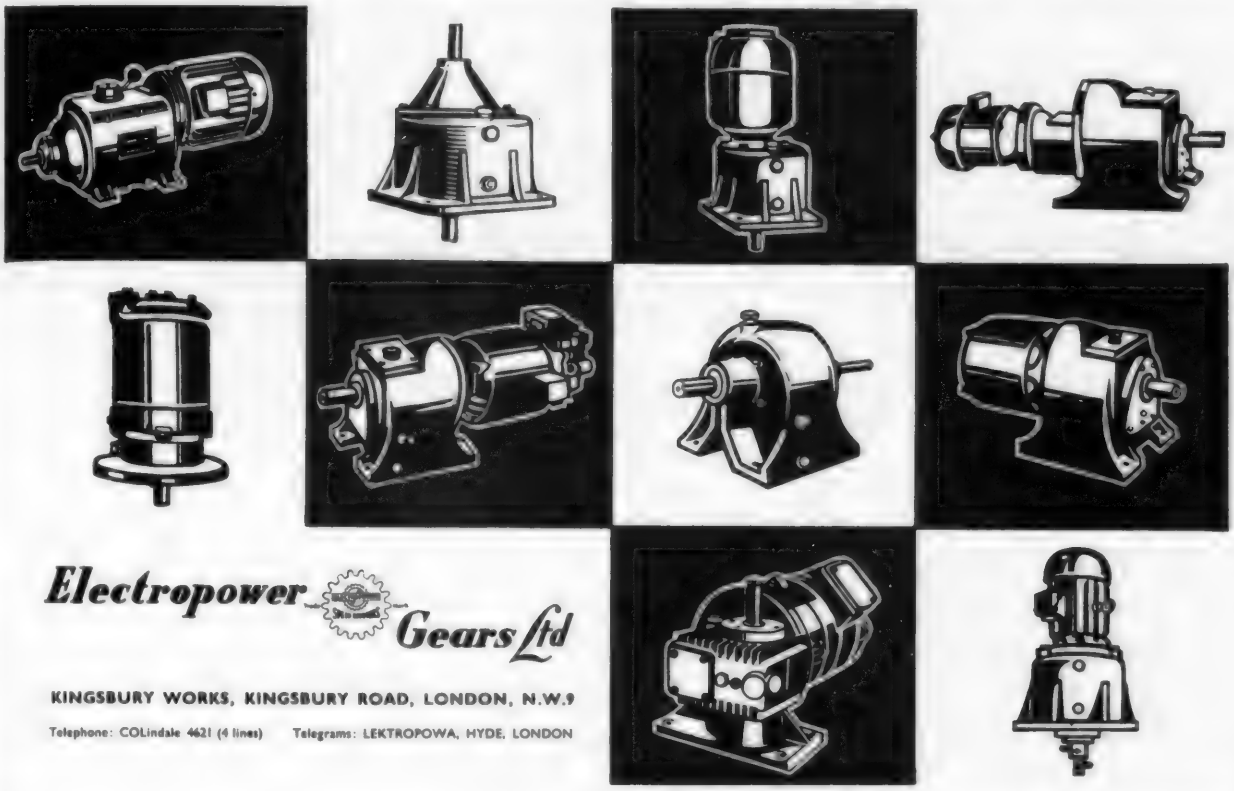

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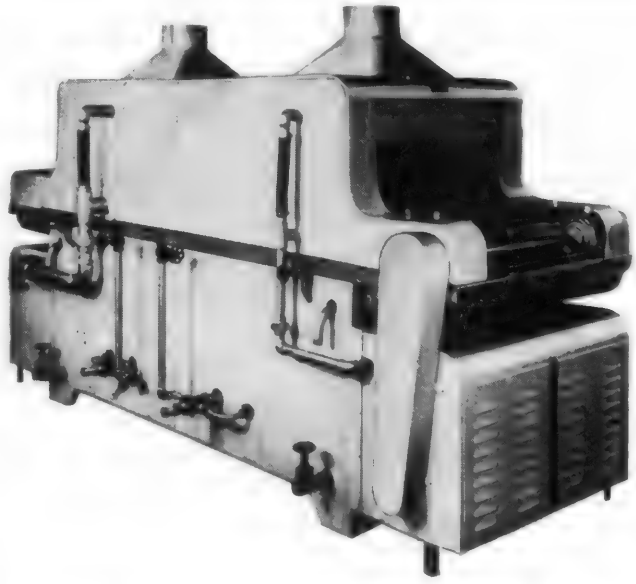

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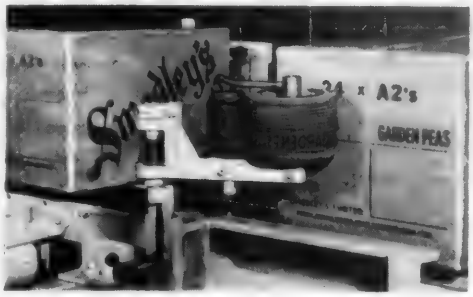

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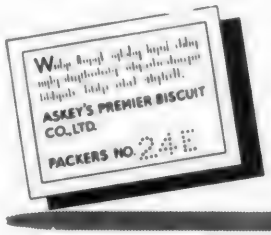

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9 Eden Street, London, N.W.1

Telephone: EUSton 5911

The following applicants for employment have been accepted for entry in our Appointments Register. Employers and Personnel Officers wishing to be put in touch with these applicants are invited to communicate with I.S.I.S. Appointments Register at the above address, quoting reference number.

Ref. A.55. British. Male. Age 51. Physical Fitness Excellent. A.M.I.Mech.E., M.I.Mar.E. and 2 years advanced course Marine Engineering Design, and course on Industrial Gas Turbines. Experience: 18 years Royal Navy as Engineer in Charge steam driven machinery, Assistant to Admiralty Engineer Overseer engineering materials and machinery. 3 years Chief Engineer jig and tool manufacturers vibration and sound isolation problems. Production Manager to Chemical Plant manufacturers. 4½ years Senior Mechanical Engineer Oil Company for development projects, including diesel and gas turbine power stations. 8 years Petroleum Company Station Superintendent with complete charge of Technical and Administrative activities of 300 employees. Now seeking engineering appointment, salary £1,600-£1,800 per annum.

Ref. A.56. British. Male. Age 23. Single. G.C.E. with A level Chemistry, Physics and Mathematics. Just passed Part I B.Sc. Chemistry. Now seeking permanent post as Laboratory Technician or Assistant Experimental Officer, preferably with Chemical Manufacturing concern in U.K., with commencing salary of £520 per annum.

Ref. A.57. British. Male. Age 56. Married. M.I.Mar.E., First Class B. of T. Cert. for Competency for Steam. Experience: 22 years Merchant and Royal Navy. 2 years Admiralty Engineer Overseeing Department as Engineer Inspector. 7 years Staff Foreman marine engineering installing for new ship construction. 5 years Dredging-Engineer. 2 years Superintendent Marine Engineer for new ship construction South America. Seeks post as Maintenance Foreman Boilers, turbines and associated auxiliary machinery, or Hospital Engineer Superintendent, U.K. Salary required £70 per month.

Ref. A.58. British. Male. Age 21. G.C.E. Experience in glass/fibre mouldings. Seeks post as Laminator or Trainee Laminator. London. Salary £550 per annum.

Ref. A.59. British. Male. Age 20. G.C.E. Seeks post as Laminator or Trainee Laminator. London. Salary £450 per annum.

Ref. A.60. British. Male. Age 33. Single. Ordinary National Certificate (Chemistry). Experience: 6 years Assistant Chemist, Electricity Supply. 5 years Technical Assistant aircraft industry testing and sampling aviation fuels and lubricating oils. Seeks post as Assistant to Manager of Petroleum Storage Installation. London Area or Essex. Salary £800-£900 per annum.

Ref. A.61. British. Male. Age 26. Married. B.A.(Chem.). 1 year Spectroscopic Research. 3 months training course for Production Industrial Engineer. Present Employment: Plant Manager with chemical manufacturers. Speaks fluent French. Requires post abroad (Canada preferred but will consider other countries) with opportunity to learn and practice modern Production Techniques. Commencing salary £1,100 per annum.

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Membership of the University Institution's Provident Fund and of the Institute's Medical Aid and Group Insurance Schemes are compulsory (the Institute contributes to the Provident Fund and the Medical Aid Scheme on a £ for £ basis).
The cost of transport of the successful candidates (and their families) to Cape Town will be paid by the Institute.
Applications should be addressed to the Director, Fishing Industry Research Institute, University of Cape Town, Rondebosch, C.P.

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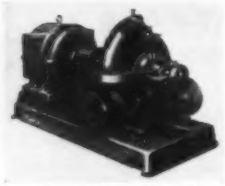

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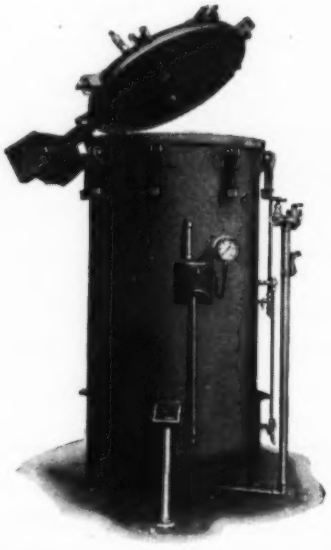

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